COMMITTEE WORKSHOP

BEFORE THE

CALIFORNIA ENERGY RESOURCES CONSERVATION

AND DEVELOPMENT COMMISSION

In the Matter of:	)	
	)	
Preparation of the 2007	)	Docket No.
Integrated Energy Policy	)	06-IEP-1E
Report (2007 IEPR)	)	
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CALIFORNIA ENERGY COMMISSION

HEARING ROOM A

1516 NINTH STREET

SACRAMENTO, CALIFORNIA

THURSDAY, APRIL 19, 2007

9:00 A.M.

Reported by:
John Cota
Contract No. 150-04-002

CEC COMMISSIONERS PRESENT

Jackalyne Pfannenstiel, Presiding Member

John Geesman, Associate Member

Arthur Rosenfeld, Associate Member

PUC COMMISSIONERS PRESENT

John Bohn

Rachelle Chong

CEC STAFF and CONTRACTORS PRESENT

David Hungerford, PhD

Ahmad Faruqui, PhD, The Brattle Group

Margaret Sheridan

PUC ADVISORS PRESENT

Andrew Campbell, Advisor to Commissioner Chong

Stephen St. Marie, Advisor to Commissioner Bohn

ALSO PRESENT

Lynda Ziegler, Southern California Edison (SCE)

Ed Fong, San Diego Gas & Electric (SDG&E)

Steve McCarty, Pacific Gas & Electric (PG&E)

Bill Roberts, PhD, Building Owners and Managers Association, (BOMA)

Marcel Hawiger, The Utility Reform Network (TURN)

Mike Oldak, Edison Electric Institute (EEI)

Chris King, Silicon Valley Leadership Group (SVLG)

Charles King, California Independent System Operator (CA ISO)

Barbara Barkovich, PhD, representing California Large Energy Consumers Association (CLECA)

Ren,e Gould, Global Energy Markets, Inc. (GEM)

Gregory Tropsa, Ice Energy

Greg Ashley, Sun Edison

Andrew Bell, Pacific Gas & Electric (PG&E)

I N D E X

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P R O C E E D I N G S

9:34 a.m.

PRESIDING MEMBER PFANNENSTIEL: This is a joint hearing of the Energy Commission's Integrated Energy Policy Report Committee and the Efficiency Committee. I'm Jackie Pfannenstiel, I'm Chair of the Commission and I am Presiding Commissioner on both of those committees.

It is also a joint proceeding because it is joint with the Public Utilities Commission who shares our interest in the subject of demand response. So in that regard to my far right on the dais is Commissioner John Bohn of the Public Utilities Commission.

And to my next right and Commissioner Bohn's left is Commissioner John Geesman, who shares with me responsibility for the Integrated Energy Policy Report this year. And to my left is Commissioner Art Rosenfeld who is with me on the Energy Commission's -- Perfect timing, Rachelle -- Efficiency Committee.

And joining us on the dais is Commissioner Rachelle Chong from the Public Utilities Commission.

As we all get started let me just offer

my observation that this area of demand response is one that is very important to both Commissions. It is important, I think, as a resource option and it's important because it's held this potential for us for so many years as a way of meeting load, as a way of sharing costs, as a way of giving customers some control.

And it is a potential that has never come close to being fulfilled I believe anywhere in the country but certainly in California. It's been high on our loading order, high on our list of what we could do, technically feasible activities that we could engage in, but we have not quite gotten there.

Commissioner Rosenfeld has been studying this since way before I got to the Commission and he and I together have been working on it. But then this year the IEPR Committee took this up as one of our big issues to ask the why question. Why are we not quite there? Why have we been putting money and activity into this? The utilities appear to be committed, both Commissions are committed. There seems to be an acceptance from the general public that we still are at a very small level of demand response that we can

count on in California.

So given that the IEPR Committee laid out a number of questions and this is the first of two workshops that we'll have on this subject. So with that why don't I ask if others on the dais have any opening comments. Commissioner Bohn? Commissioner Geesman? Commissioner Rosenfeld? Yes, Commissioner Chong.

CPUC COMMISSIONER CHONG: Thank you. I apologize for being late. We hit a little bad traffic in three different places. In the future if we could start these a little later it would be a little easier.

PRESIDING MEMBER PFANNENSTIEL: Yes, ma'am.

CPUC COMMISSIONER CHONG: I actually think that Art started working on this issue when I was born. I just thought I'd add that.

Well thank you for having me today. I thought I'd try to break up the group a little bit, get everybody relaxed.

Most certainly the PUC and the CEC have worked very well together on this important issue of demand response and I expect that we will continue to work together very well. I know I

have been working closely with Commissioner Rosenfeld particularly. And I agree we're not yet there yet but I expect that we will get much further this year.

I started working on demand response shortly after I was appointed to the PUC in January of '06 and I did want to report some things that we have been able to accomplish to make sure that our accomplishments are also being highlighted in addition to the road that we have to travel.

We have approved PG&E's advanced metering initiative. They are going to be installing five million meters between now and 2011. Deployment has already started in the southern part of the Central Valley.

Last week the PUC approved the SDG&E advanced metering project. Starting in '08 through '10 SDG&E will be installing about 1.4 million new solid state meters.

In response to the heat storm of last July the PUC approved enhancements to the utilities' existing DR programs and we created a number of new programs. We have also opened several utility programs to demand response

aggregators. We do believe aggregators will bring innovation to the utilities' efforts.

We have authorized Edison to increase its air conditioning cycling program up to 600 megawatts. And in January of '07 we instituted a new rulemaking developing standards for measuring the cost-effectiveness of demand response. We intend to conduct this rulemaking in cooperation with both the CEC and the California ISO.

I would like to mention that I want to file a petition for rulemaking here at the CEC that we could have our work days expanded to 48 hours to accomplish all the work that needs to be done in the energy area in the coming years.

In my view one area that is of critical importance is the creation of dynamic pricing options for customers. If we approach rate design with a customer perspective I daresay we can make some good progress together. If customers are given good rate options they will engage, they will find new ways to manage their energy usage. New rate options will also unleash new enabling technologies.

The PUC is going to be attacking dynamic pricing in the context of PG&E's rate design

proceeding. I think everybody appreciates how complex rate design is. I would like to invite and encourage the CEC to help us using your analytical strength and help us move the ball forward, particularly on these dynamic pricing issues.

So I thought one thing that we could use a lot of help on is this rate design issue, and if we could perhaps deploy mutual resources to that end that would be very, very helpful for us.

And I look forward to learning today from everybody and I thank you for your patience during this opening statement. Thank you.

PRESIDING MEMBER PFANNENSTIEL: With that I'll turn it over to Dave Hungerford who will be our facilitator today. David.

DR. HUNGERFORD: Thank you, Commissioner. First we need to get past a few basic topics and some announcements. If you're not familiar with the building --

PRESIDING MEMBER PFANNENSTIEL: David, would you check and see if your mic is turned on.

DR. HUNGERFORD: Maybe I should get closer to it.

ASSOCIATE MEMBER ROSENFELD: Or speak

closer.

DR. HUNGERFORD: There we go. First of all the restrooms are located just on the other side of this glass wall. There is a snack bar on the second floor under the white awning and if there is an emergency, which actually happened during a hearing not too long ago, follow the employees out the exits and convene over across the street diagonally at Roosevelt Park. You're supposed to proceed calmly and quickly.

All right, thanks. If you'll follow my lead and silence your electronic devices, we appreciate the lack of interruption.

MR. BELL: David, can the lights be turned down?

DR. HUNGERFORD: There's a button to do that. When the presentations start we'll do that. All right.

Here is today's agenda. The basic overview is we're going to go the instructions and opening remarks and then the author of the white paper, the draft white paper that most of you have seen and there are copies on the table, Ahmad Faruqui, a consultant for the Energy Commission, will present on the goals and barriers to DR.

Then we'll have a panel discussion with presentations from panelists on the barriers and goals. Then the Commissioners will have a discussion with the panelists. We ask that public comment be held until the end of the day. There are blue cards on the table in foyer that you can fill out and leave in the box and at the end of the day you'll be allowed to speak if you have your name on one of those cards. So if you could keep your thoughts until then.

We'll break for lunch and then we'll go to, and then Dr. Faruqui will again do a presentation on pathways forward, on overcoming barriers to demand response and we will have a second panel discussion from panelists who have developed some presentations and have some thoughts on those issues. And then we'll have public comments and we should be able to wrap up before five o'clock.

I wanted to point out that the purpose of this workshop is to move forward the state energy policy on demand response. The 2005 IEPR found that the state needed to address peak demand to improve system reliability.

ASSOCIATE MEMBER GEESMAN: Dave, you

promised that you'd turn the lights down. We can't see anything on the screen with the lights on.

DR. HUNGERFORD: I apologize. Okay.

The 2005 IEPR found that we needed to address system reliability and moderate electricity price volatility through reducing peak demand. And we needed to develop and implement dynamic rates for all customers with advanced metering. That we should expand the advanced metering infrastructure.

And that the Energy Commission should work with publicly-owned utilities to better understand their demand response efforts and develop goals similar to the IOUs. And that the PUC and the Energy Commission should work together to pursue these goals.

With that I am going to turn it over to Dr. Faruqui and he is going to start our morning.

DR. FARUQUI: Thank you, David. I want to thank the Commissioners for inviting me to lead the discussion by giving an overview of the white paper. The way the white paper is organized it has four sections. The first two focus on goals, accomplishments and barriers and that will be the

focus of my presentation this morning.

The second two sections deal with looking at the future. What are the options, what are the opportunities, what have we learned from other regions? That will be the focus of the afternoon session.

So let me begin by summarizing what I believe most of you now familiar with but just for the record I thought it would be useful to lay out some of the facts that make demand response a very interesting and important option for the state to be looking at.

In this graph I have plotted the load duration curve for the investor owned utilities in California using the latest available data that we could find, which I believe the shape hasn't changed all that much since 2004. The top one percent of the hours account for more than ten percent of the peak load. That's the message and the story as to why simply doing energy efficiency programs will not be sufficient. Why we need programs that target that top portion of the peak.

And for those of you who are familiar with data from other states and other regions this will be no surprise. At a conference not too long

ago I was in a meeting with the head of the ISO in Ontario and he talked about the fact that the top 32 hours in Ontario, the Canadian province of Ontario, accounted for 2,000 megawatts out of their 27,000 megawatts at peak.

So in climates that have the kind of high temperatures that we experience here in California it is quite normal to see a really steep slope in the top one percent of the hours. Those are, of course, the most expensive hours to serve and that's why the demand response activities require added (inaudible).

So that leads to the next question, which is what is the market potential for demand response. According to work that was completed in the statewide pricing pilot, in which I know several of you were involved, and other work that has been done for the large customers in the last two or three years, the results are indeed impressive. The market potential numbers that I am showing you here assume of course that 100 percent of the customers are involved in the program. So that is why it is a potential and not a projection or a goal. But it still forms a useful backdrop against which we can evaluate our

successes and perhaps lack of successes.

The results from the statewide pricing pilot, the SPP, indicate that the market potential is seven percent of the residential market. By which I mean that seven percent of the demand during those top critical hours can be shaved off through demand response.

And by demand response here, in keeping with the terminology that was used for the goals, I am focusing on price-based demand response as opposed to emergency or reliability-based types of programs.

Focusing primarily on things like critical peak pricing, for example, which was tested in the pilot, assuming 100 percent of the customers are on those dynamic pricing rates, we'd expect to see a reduction of seven percent in the residential peak demand given the elasticities of the demand curve that were measured and estimated over a period of three years.

For the small, commercial, industrial segment, for a variety of reasons that are well-known to you, the potential is much smaller and it checks in at just under one percent. And that's the two customer groups that are under 200 kW of

demand, the residential and the small commercial.

And now turning to the large commercial and industrial segment, about 200 kW demand. The potential is another seven percent. Again using numbers that have been validated in evaluations carried out over the last few years with actual programmatic experience that the California utilities have implemented.

So when you add up those numbers you're looking at a number of around 26 percent as a whole. Each class has a different share of the total peak so you can't just add up the percentages to get the 26 percent. You add the impacts and divide by the total peak load and you get the 26 percent number. That's the market potential. Keeping that in mind the state's goal was set at five percent, which is a fifth of the market potential number.

The five percent number that you are all familiar with could represent savings of $1.8 billion in avoided costs. The way we calculated this was we took a five percent demand reduction, we applied a value of $58 per kW a year for the capacity price over a 20 year horizon using a 15 percent discount rate and various assumptions

about peak growth and how energy and capacity benefits would be shared, we came up with this number.

Now keep in mind I have also allowed in this calculation an estimate of the reduction in wholesale prices that would occur conditional of the fact that we don't have a market right now. We looked at the numbers from a recent PJM study. This study was done as part of a project with five states and PJM. And that indicated that beyond the capacity and energy benefits that you will get, you would also get a reduction in the wholesale prices.

And that would be about twice the size of the capacity in energy reductions. Of course it is not necessarily a long term effect but it is certainly an effect that will be there in the next two to three years. So that's some of the background on how this estimate has been developed.

All right, so now let's talk briefly about the demand response goals in California. Our survey carried out with the participation of several of you in the room indicates almost beyond a shadow of a doubt that barring a miracle the

state will not achieve its goal of five percent reduction in system peak demand this summer. There is no surprise in that. I think it's a headline that is somewhat old.

But let's go behind that and try to look at some of the reasons as to when was this goal created, how was the goal defined, how has it been refined subsequently? And what obviously leads to the ultimate question, what are the outstanding issues.

Just to go back in time four years. In May of 2003 the Energy Action Plan set the state's initial DR goals. Key elements in the Energy Action Plan were that the state would implement a voluntary dynamic pricing system to reduce peak demand by as much as 1,500 to 2,000 megawatts by 2007, which at that time was four years out.

Energy efficiency and demand response were identified as the top priorities towards meeting the state's energy needs.

The annual goals for DR were laid out in a June 2003 CPUC decision which laid out the goals that you're seeing here. The developed gradually, and by the time we arrived at the year 2007 five percent of peak was the number here shown in red

for all three IOUs.

An important element of the goals was that they focused on price responsive demand response programs. Other programs, reliability kinds of programs were recognized as being important, and indeed being very important for preventing blackouts, but did not count towards the DR goals.

So among the price responsive programs customers could choose how much load reduction they could provide based on the electricity price or load reduction incentive that was provided to them on a per kW or per kWh basis.

It included all those programs for which a signal was provided on a day-ahead basis regardless of the program's trigger. These were day-ahead programs. And a prominent example of that was critical peak pricing, or CPP as I will be referring to it in a couple of slides from now.

And just for definitional purposes just to be clear, the reliability triggered programs were also out there. They did not count towards the five percent goal. An example of that is direct load control programs.

California's DR policy also maintains a

distinction between large and small customers, recognizing their different needs, characteristics and resource availability and expertise. Large customers are above 200 kW in demand, they are already equipped with AMI. They can immediately take advantage of dynamic pricing. The approved programs include critical peak pricing, also hourly real time pricing and demand bidding.

Among the small customers the California Statewide Pricing Pilot was a leading example to demonstrate that these options did work even for the smaller customers. It allowed skepticism in this very room three or four years ago when the whole process began. I am happy to report much of it has dissipated but perhaps not all.

The AMI filings that were referenced earlier in the comments of Commissioner Chong were facilitated by the findings of the pilot. And the pilot I think was a really good example of the two Commissions and the staffs, the intervenor groups, really working together to prove that demand response is available even for the smallest market segment. And those were some of the initiatives that California took in the way of the western energy crisis.

The annual budget for those DR programs have more than doubled since 2003. The specific numbers are shown here and the details are in the white paper for those of you who want to look them up. Okay, so what are the results? That is the ultimate question. The funding was approved, the goals were established and the race was on to meet the five percent target.

Well at this point the best projection we have is that we will achieve 44 percent of the goal; 2.2 percent is the number that we are looking at based on utilities' plans as filed with the Commissions. The 2.2 percent represents roughly 1,000 megawatts out of a peak of 47,000 megawatts for the three investor owned utilities. It's not by any means an accomplishment to sneeze at, it's a large and significant accomplishment, it's just 44 percent of the goal.

I think it is important to keep in mind that the interruptible programs are still out there and they are a very important part of the state's energy planning process. They are projected to achieve a 3.4 percent number. That represents 1,613 megawatts relative to the 47,000 of projected peak.

So against that background we have a number of issues that obviously need to be resolved in order to make headway toward achieving the goals. If not this year perhaps let's say in the near future. These goals need to -- Some major issues need to be resolved in order to get there.

And perhaps sort of the pink elephant in the room that is not in the slide, which I should certainly mention as I now think about it, is the fact that the goals were for all of the customers combined but a very large portion of the load comes from the residential and the small C&I customers under 200 kW demand who do not have yet those meters, the advanced meters that are needed in order to set out the dynamic pricing state goals.

So as progress is made towards putting those meters in a major impediment will go away. That impediment certainly for 2007 has been a big challenge. But by 2010 and 2011 much of that impediment will go away. But as you will see in this hall of mirrors there will be many other impediments that have to be overcome. We'll get into those in the afternoon. But that is a

recognized barrier, it is being addressed and I have not listed it on this slide because it has been discussed in the AMI filings .

So beyond the AMI filings what are some other issues? Well, the first major issue here is measurement and evaluation. That has been around for at least 30 years. That issue has been worked and reworked at many conferences, mostly from energy efficiency. I think several of you are familiar with the wonderful Asilomar Conference Center environment in which the energy efficiency issues have been debated.

They have only recently become real issues for demand response. In particular some of the issues that are coming up have to do with the fact that unlike an energy efficiency program when the service level is not compromised, if you're doing a well-designed program, the lights are not dimmed and the air conditioner doesn't cycle and loads are not, you know, shed, loads are maintained, service levels are maintained. And so it is pretty reasonable to assume that the service level is constant, the only thing that has changed is the electric energy going into the device.

Well when you come to demand response

programs there will be some loss of service quality. How does one quantify that loss of service quality? That's the major issue in the cost benefit analysis test when you apply those ideas to demand response.

Another issue that comes up is the difference between enrolled load versus expected load. You can have a lot of load that is enrolled in let's say some kind of a large customer program like a demand bidding program. But when the time actually comes to exercise that enrollment a lot of the load may not be there. So there is a difference between expected impacts versus enrolled impacts.

It's kind of the difference between potential and reality and that is a real issue when dealing with a lot of these programs for the large customers. Those are unique issues that are there for demand response that need to be addressed. And perhaps in the new rulemaking that Commissioner Chong talked about these issues will be discussed and analyzed and closure brought to them in those discussions.

Another big issue is the challenge of cost effectiveness. There doesn't appear to be a

consensus or an industry standard for doing cost effectiveness analysis of demand response programs. Which is not to say that it has not been done, it is being done with the tests available.

Specifically the tests I'm referring to are the standard practice manual tests, again that were created for the most part for energy efficiency programs. Those are being sort of bootstrapped and they are being brought in and applied but there are many issues that are being overlooked.

One simple issue is the issue of option value. Many people talk about the fact that the demand response, the technology is really a call option. It is a dispatchable option. But it has special value and virtue as a result of that property but it doesn't get recognized when all you're looking at is the avoided cost of the CET. So does it give you additional value that should be recognized and if so how do you do it?

PRESIDING MEMBER PFANNENSTIEL: Excuse me, Ahmad, before you move off of this slide. This question of M&E and cost effectiveness. I agree with you, it's dogged this whole effort for

years and yet as we spend our time trying to hear a precise about answering these questions.

You talked about trying to move to closure on it. That's exactly what we haven't done. We've discussed it, we've analyzed it, we've done elasticity studies for 30 years on this. And yet it's elusive in trying to find the real, I don't know, unchallenged metrics for this.

And so at some point I guess we need to rely a bit on, you know, what we know and then move on and then get some experience. My real question, i think beyond that diatribe was what are others doing? I know you're going to talk later about experience elsewhere but has anybody sort of cracked the code on how to move ahead given the uncertainty here?

DR. FARUQUI: That is a very good question and I think it is a very apt question given the timing. If these issues have lingered on for 30-some years and not reached final closure in the past three decades what hope there is in reaching closure in the next 12 months? And I would say hope springs eternal.

But on a more serious level what I am going to say is that what others are doing is

going with the available techniques and not letting them stop from reaching closure. So Commissions in other states are comfortable generally looking at the existing standard practice manual tests.

They recognize that there are tradeoffs in perspectives. The total resource cost that looks at everyone collectively. The participant test just looks at the participants separately, it looks at their customer bill impacts. And then you have the rate impact measure test.

Those tests provide, I believe personally, a valid means of evaluating demand response programs. Not necessarily a perfect means but a valid means. And we can always improve on methodology.

One of the tests that has been out there, again for 30 years, actually was applied by the Los Angeles Department of Water and Power when they did their first time of use experiments in the late '70s. It's a test that is sometimes known as the consumer surplus test or the economic surplus test. It accounts for loss in value of service, which as we know is a key attribute of demand response programs.

When you cut your peak load as a customer you obviously experience some discomfort and you make that tradeoff because you save money. You make that tradeoff but does that saved money account for all of the discomfort you experienced? Well the consumer surplus test argues, no it doesn't.

So that method is there but for 30 years it has not been used by the regulatory circles because as Eric Hirst put it about five or six years ago when I first started raising that issue, he said, well nobody knows what the elasticities are so don't bring a red herring into this discussion room because that will be the end of the conversation.

Well the reality is now we know what the elasticities are. And certainly with the Statewide Pricing Pilot in particular you have got them pinned down reasonably accurately so we can actually begin to implement it. We could implement it tomorrow.

But there are other dimensions, there are other issues. I don't want to minimize the importance that there are weaknesses in the test. It's just that in my personal view a lot of the

good stuff is already there and that shouldn't by itself be a barrier to doing the analysis.

ASSOCIATE MEMBER GEESMAN: I am having a bit of a hard time in a California context of trying to determine just what are the threshold questions that this cost effectiveness test is designed to illuminate. It seems to me that in California, rightly or wrongly, we've already made the decision to invest in the hardware infrastructure and that's a sunk cost.

And going forward it would seem to me the question is how best to utilize that hardware that we've already decided is going to be installed. And frankly the example set by the investment in either 2001 or 2002 in the large customer meters does not set a very inspiring precedent.

The state general fund expended some $30 million to put advanced meters in all of the large customers' facilities and here five years later we have yet to figure out how to make best use of that infrastructure investment. So I'm a little puzzled as to in a California context just what is it are we looking for to learn from these various cost effectiveness tests.

DR. FARUQUI: I think you have raised a good point, particularly for the AMI investments for the smaller customers, and for the larger customers the money is already spent. So what is the cost effectiveness now going to tell us? That we made the wrong investment perhaps? I mean, that's all one can hope to get out of a test carried out afterwards.

This issue came up in a lot of conversations we have had with the state but there's still lingering concerns and doubts about the tests. I have included it here just from that viewpoint. I am not necessarily saying that this is a serious issue. It's an issue that a lot of other people feel needs to be continuously improved and evaluated.

I also want to cite the example of the province of Ontario, again, because they actually made the decision to go ahead with smart meters without doing any tests. I know in the California PUC proceedings on AMI, not for the $34 million that was spent on the large customers that you referred to but on the smaller ones, generally the TRC test has been used.

The avoided cost of capacity and energy

has been put against the cost of the meters once the operational savings are subtracted out. So the gap from the operational side was compared to the avoided cost of capacity. If a positive result was achieved, as it was in two of the three filings, the third one hasn't been made, a decision was made to move ahead.

So I personally don't see this as holding up forward movement and it is certainly not the reason why only 2.2 percent was achieved versus the 5 percent. But as we look at the future and if you look at how to redesign the programs, particularly looking at the customers' perspective.

Because if the programs are ultimately going to be voluntary programs, let's say the dynamic price options do not become the default rate but are instead designed to, you know, solicit customers in a voluntary mode, then their loss of service needs to be recognized and addressed.

So to some extent I believe those are design issues as opposed to go/no-go issues on the cost of the meters. We'll have a chance to I think come back to this when we look at what the

panelists have to say on that issue.

Okay. So that obviously leads into this issue of barriers to demand response. Some of you attended, I believe, the conference in Berkeley last June, which was the symposium on demand response and a national town meeting on demand response, and there was a lot of discussion of barriers.

And for those of you who have been around this industry as long as some of us have this will not be anything new. It's just sort of a repetition that goes through every five years and gets an update but there's always some new wrinkle. So I'll show you the barriers that surfaced and there are a couple of new twists here.

First of all let me tell you how we went about developing this list of barriers. We could have created these barriers one evening in a bar, you know, David Hungerford and I, and I suspect the list wouldn't have been a whole lot different from what you see here.

But for better or for worse the nuance and character and credibility is not what the message but whose message is it? And so this is I

would say the industry's message. This is not just the message that David and I came up with.

So we developed a list of what we regarded as people who are actively involved in the success of demand response. Or in some cases, involved to make sure it didn't succeed. You know, it depended on your point of view. There are multiple viewpoints of demand response. It is not everybody's equivalent of applehood and mother pie -- motherhood and apple pie.

(Laughter.)

DR. FARUQUI: So we interviewed two dozen people and then a couple of people heard about the interviews and said, hey, how come you left us out so we enlarged the number to 26. We let them in.

We interviewed some of the individuals in person where it was convenient to do that, some over the phone and a lot of people responded via e-mail. So we got it from all different perspectives.

We talked to the investor owned utilities and the municipal utilities. We talked to whoever we could talk to. Other people didn't want to talk to us but we at least tried to talk

to them. We talked to intervenor groups, we talked to the ISO, we talked to equipment vendors.

We also went to academia and we talked to the academics, one of whom interestingly enough proceeded to just edit the questionnaire and make nasty comments. Once we had cleared that hurdle I said, oh, and do you have a response? No response came. Well, what would you expect, it was an academic conversation.

We talked to special interest groups and we talked to people not just in the Golden State but also to those in the rest of the country. We even went to Ontario to talk to them over the phone. So we talked to a cross-section of people. The purpose was to see, are we missing anything obvious and there was a list that came out.

Several types of barriers were mentioned and I will speak briefly about each of the barriers. I don't have a slide on each, they are discussed in detail in the white paper. And if you didn't get a copy there are, I believe, a few copies outside.

You can read the comments. You might even recognize something you said if you were one of the people interviewed. We tried our best to

make it anonymous. Hopefully we didn't disclose inadvertently anyone's identity.

So the first one was the rate freeze that is imposed by Assembly Bill 1X, or AB 1X. I remember sending out this questionnaire to somebody in another state and the response came saying, what is AB 1X. Well everybody here I believe knows what AB 1X. That issue, no surprise, came up.

The second issue was lack of penetration of advanced metering, which I alluded to earlier, you're all familiar with. This was mentioned as a near-term issue. One that would go away in the next three to five years but certainly has prevented the five percent target from being even within a reasonable chance of occurring.

When you exclude something like 30 to 40 percent of the market because you cannot offer those pricing options to them that means that the others that remain had to respond a lot more than five percent for the average of the system to come in at five percent. We discussed that in the white paper, the actual numerical analysis is there.

But the five percent really became much

more than five percent for those who weren't flagged. I think that was probably as important a constraint as the AB 1X freeze. Actually the AB 1X freeze didn't play a role because those meters were currently not in place so the rates wouldn't be offered to begin with.

I think that test would be carried out once the meters are in place and then that card will come up, we can't do it because of the rate freeze. But those two are the most recurring sort of chestnuts, I guess, that kept coming up.

The third one was lack of cost effective technologies that allow DR to happen. And this was cost effective from the customer's perspective. The customer cannot do anything, was a comment we heard over and over again. And, you know, I have heard that now for 30 years and I have heard that even after experiment after experiment has shown that they can certainly do a lot.

And I think what confuses the conversation is that every one of us is a residential customer, in addition to whatever hats we wear. And we have spouses and we have children and we have soccer activities and we have people

who are ill. There is always somebody who has a unique situation who cannot respond.

But the Statewide Pricing Pilot shows that not everyone needs to respond in order for you to get the full, healthy, average response. We have the 80/30 rule in the Pilot, 80 percent of the response came from just 30 percent of the customers. Those were the heavy hitters. There were a lot of other customers who were marginal players and there were many, maybe as many as 40 percent, who didn't do a thing because of lifestyle reasons.

So the fact that this problem comes up is simply a statement that that person or that individual feels like not responding. They don't think it's a good idea. But there are many others who do as we have seen in many pilot programs.

It is not my job here to evaluate and sort of rebut these challenges but occasionally I will say a few words along those lines because the feedback surprised me. I thought I should share that with you. Okay.

The fourth one was lack of consumer interest. Apathy, they don't care. They spend $3,000 a month on mortgage payments. That's again

an issue with the perception. How strong it is you will see in the next chart but it was mentioned fairly often. That, you know, they don't care.

Next was ineffective program design and marketing. And surprisingly this didn't just come up from the non-utilities. It was mentioned by everyone as a concern. The program design needs to be improved so that the customer is engaged and decides to participate.

There was certainly the fear of utilities about being able to recover their costs in the advanced metering infrastructure. that actually is a concern I hear a lot in other states. But in California it was not given a whole lot of weight but it is certainly a factor that was mentioned. But by and large my perception was, and certainly the panelists can add their perspectives on it, it was not viewed as a serious concern in California.

What was viewed as a serious concern was fear of customer backlash. The headlines would be that XYZ utility raises the price by a factor of five and you are going to be gouged big time. And nothing would be said about the fact that the

price had been lowered on all other hours of the year. That customers would just get this rate shock and there would be a rebellion. Many people talk about the San Diego episode as reminders that are still fresh in people's memory. So do anything at all possible to avoid the customer backlash.

There was also concern that there is a plethora of programs out there now on the demand side, a lot of energy efficiency programs in particular, and they are also called sometimes demand side management programs or demand side programs, and now there's demand response programs. There's all this demand stuff out there. A lot of demand is being made on me as a customer, I don't know what to do.

There was a concern expressed by some individuals that the load shifting and load curtailment that would occur with demand response might actually create an environmental problem by shifting load to the off-peak hours. There might actually be more energy being used and more fuels being burned and it might be debilitating to the cause of the environmental issues. This concern was expressed but not as strongly as I have seen

it being expressed in other states.

There was a comment that low prices for capacity and energy in the current market were not necessarily creating a favorable situation where demand response would receive the kind of interest it needs.

Even though some people argue that it actually was a good thing that prices were generally low right now because if you were to institute demand response pricing, dynamic pricing, then there wouldn't be immediate rate hikes. As opposed to a time when there was really a crisis, prices were already high to begin with and then you appear to be raising them even more.

Some people argued that it was a good time to do it when prices are low in the wholesale market then when prices are high. But others argued well then it doesn't look like it was a necessary thing to do. You should only do it when there is a crisis. When there is a fire you want to put it out. When there is no fire why does anybody want to invest in, you know, fire-putting-out technology?

Some people also said that there have been no blackouts and people had gotten used to

not having blackouts. So if a blackout could be arranged, one person said, it would be a good thing.

So again, you know, we had a pretty open-ended conversation, all kinds of perspectives came out. Some of these are more important, some are less. The last two that I mentioned certainly were, you know, issues that just reflect the current reality. Nobody wants a blackout and it would certainly not be a good idea to create a blackout, even the person who said it argued.

But that person said that that diminishes the immediacy of the problem. That you need a crisis to get people focused on a solution of the crisis. This kept coming up over and over again. It was somewhat annoying actually but it wouldn't go away. Okay.

There was an issue of the state/federal coordination I guess between the ISO and FERC and how to get those parties engaged with the utilities which actually do the retail rates. And so it was an issue that kind of went actually beyond just the state/federal connection. We talked to one FERC Commissioner who has some very strong positions on demand response and FERC has

made it very clear they want the state commissions to do a lot of demand response.

It's not clear just having the desire is enough. Ultimately it has to be actualized in retail prices. I think some of you may have seen a report that came out I believe two weeks ago that an interagency task at the federal level looked at how competition is working in the United States. It talked about a lot of the things that are working and a lot of the things that are not working.

Among the things that are not working it listed retail rates are not providing an incentive to help customers curtain their load during peak times and dynamic pricing needs to be carried out at the state level was the message from that finding. So to a large extent this is that issue coming up here.

And then the issue was that in California for awhile the wholesale market has not been connected to the retail market. There is, of course, the MRTU activity underway. There was a lot of hope expressed that perhaps in a year or two once that is in place, and I guess we'll get to hear from the ISO in the afternoon panel I

believe. Once that falls into place things should improve.

One panelist, well I should say one interviewee commented that how do you do real time price when you don't have wholesale spot market? What price signal is it on an hourly basis that you're going to transmit to the customers? Even if the customer is willing to take it how do I convince them this is the correct price signal? So that issue came up quite a bit. One or two panelists thought it was the defining issue that will prevent dynamic pricing from happening in California unless that link is created between the retail and wholesale markets.

And I can tell you, even though this person was very energized about the issue I have been to countless other states where there is no such disconnect. And there are 18 other barriers like this that are mentioned. No sooner do you mention the word dynamic pricing and everybody has their favorite list of barriers that pop up.

So it is not a California-specific challenge. I believe it is a national challenge. And it certainly is a real problem. It's like one of those big balloons. You grab it on one side,

it goes to the other side. You grab it from the other side and it expands on the port side. So it is a challenge how to pin it down and make it happen. Okay.

So that was the laundry list. Here is the top nine list, which is the Letterman version minus one. What we did was we asked our interviewees, on a scale of one to five, a Likert scale technique here, to rate these issues, five being the most important and one being the least important.

Low AMI penetration got the top prize, and it had a score of four. That was the average across the respondents. Not all of the 26 respondents filled out the Likert scale. Most of them did but it varied by question, which is of course the traditional challenge when you do that kind of a survey. What we got as high score, low AMI penetration.

Just for reference I am also showing you the standard deviations, those are the second bars in yellow, and that's just to indicate whether there was convergence or divergence of viewpoints on that issue. And the standard deviation that we had was really low on this particular issue. Just

about everyone agreed that this is a short-term problem, it is going to go away, but it is holding us from achieving that five percent number.

Second on the list was ineffective program design. That was particularly mentioned in the context of the larger customers where there is no AB 1X, that there is no cost effectiveness of meters. They were already paid for by the taxpayer, have been for five years.

The challenge was, how do you design the program to address customer concerns and nobody claimed to have solved that riddle just yet. I mean, everybody recognizes for the issue more conversation than dialogue was needed to wrestle with it.

Third, low consumer interest. That kept coming up, that customers don't care. They have many other priorities. Now to me it's the flip side of program design. The two go hand in hand. Because effective program design will capitalize on consumer interests, whatever they are, to try to recruit them into the participation. So maybe it is the same issue just showing up, you know, two different ways.

Maybe even with the best program design

customers will not participate. In which case we can go through with ultimately a product nobody wants to buy. It could be that. Currently it is too soon to say. Nobody was so cynical to say to us during the interviews that this is a product that won't sell. Everybody agreed it was an important product, it was valuable for the state. The question was how to get customers interested. And that's where the code has not been cracked yet.

Then of course came AB 1X. A few people actually said it was not a barrier. And that was actually a very interesting conversation, that's why you see the standard deviation when AB 1X is higher than on the first three issues.

There were some people, initially I thought they were being just, you know, rhetorical, and these were the kinds of people who tend to debate a lot of issues in their real lives so I thought, you mean, your typical cynical mood or what is it. The response was no, it is an issue which had a solution.

And the peak time rebate, which you will hear about that some of you are quite familiar with, was mentioned as a way around that. You

know, some like it, some don't, but certainly it was mentioned as a way to circumvent the problem.

Another comment was, well, you can do voluntary programs. And if the customer self-selects into another rate which, you know, is going to be a pricing rate that they have taken themselves out of the protection that AB 1X provided, it doesn't apply to them anymore.

So that's why some people said it was not an issue. But I would say the preponderance of opinion was that it's really a show-stopper kind of an issue and a way has to be found around it. And actually some very innovative suggestions were made on how to circumvent AB 1X. Which at the appropriate time, you know, I can bring up.

Okay, so one, two, three, four. Now we are on the fifth issue. The fifth issue was that customers don't have options to respond. There is lack of automation, it's very expensive, the customer doesn't want a technician coming to their house because then they have to stay there and meet the technician. The four hour window that sometimes becomes six hours. And then they come in, they mess up the appliance and nothing works so they have to call again, he has to come back.

So the options are there technologically but the customers are not excited, thinking that they are too expensive or too inconvenient. This is not my position, this is what I've heard so please, you know, keep that in mind. I am just replaying the mirror to you.

The confusion with energy efficiency programs came up not quite as much as I personally actually thought it would have because I, just looking at the number of programs we have in this state versus the number of programs in other states, I think California gets the top prize in terms of having more demand response and energy efficiency programs combined. Probably in all other 49 states combined divided by ten. So confusion with energy efficiency programs was mentioned by some people. Okay.

The utility concerns. And this was not just mentioned, by the way, by utilities. This was mentioned by others as well. That there is a concern about not being able to recover costs after the fact and maybe that's what is really keeping this from happening.

Fear of customer backlash didn't score as highly as I personally thought it would but it

was certainly there and got an average score of 2.5. And the reason it didn't score so highly as I thought it would is look at the standard deviation. Huge. Some people thought this was the biggest stumbling block whereas others thought, no, it is just a bugaboo that is really an invention.

Some people just don't want to do it and they'll come up with every reason not to do it. That was the comment that one group made. The other group said no, it's a real concern. Any time we talk about raising the current peak price, even if it is just for 40 or 60 or 80 hours, the red flag comes out. The customer says, I am already paying a very high price, I don't want a rate hike.

And then the others who say, yeah, I know we get a lower rate in the off-peak hours but I cannot shift my load. My business or my lifestyle is limited to the peak hours that you have targeted. Those five hours of the day to me are the most important hours of the day. I didn't buy my air conditioner not to use it. That kind of a thrust. So there was again, a huge variance around that issue.

The environmental concerns scored the least of all of the issues. Perhaps that is not a surprise since I think most people here do not see this as a concern. I have seen it, for example, when the Puget Sound energy pilot was being conducted, the time of use rates up in the state of Washington. It was just a time of use rate without a dynamic pricing rate. So there was simply load shifting and a lot of off-peak hours. The concern was expressed quite visibly by some of the groups there that basically it would end up burning more coal in the off-peak hours and cause environmental harm.

It has come up in a study from PJM which of course has a very different generation fuel mix than California. I personally, all the analysis I have seen with the load shift changes the dynamic price program is going to create it's highly unlikely that it will lead to load building.

Actually there is a lot of work that was suggested to the contrary and I believe Chris King has joined us. He has co-authored a paper not too long ago on that very subject. However it remains a concern and it was voiced and expressed so we asked people about it. Interestingly enough it

was the ninth, the lowest ranked of all the factors up there.

So to summarize, the biggest concerns were no penetration of AMI, which is being addressed. Ineffective program design and low consumer interest, I think two sides of the same coin continue to be a big challenge. And of course we have AB 1X. I would say those were the top four or five issues that formed the center of gravity of these interviews.

And that completes my presentation. I'll turn it back to David.

PRESIDING MEMBER PFANNENSTIEL: Ahmad, before you go away there might be some questions and some comments here. Let me just start with one observation and one question.

The observation is that when we looked at how well we were doing in California and you began by comparing against our goal of five percent we weren't doing very well. It did occur to me that the five percent was at the time sort of an arbitrary number and the better, I don't know, the better number that you put out there was the 25 percent, which is sort of a feasible level. So if we're comparing ourselves against the 25

percent that clearly is a long way to go.

But then the question was whether there was any response from the interviewees on this whole general question of just a basic rate fairness? Charging more when the costs are higher, which of course happens in an awful lot of other business senses, business instances, and people are used to it and accept it as the way it should be. A general sense that people are pricing. Which I remember 30 years ago that's where this whole thing began as being just generally a more fair rate design. Was that something that people are losing in the rush to quantification?

DR. FARUQUI: Well, actually this is the equity issue, the fairness question. It came up at least I would say in five of the interviews. It came up without prompting on my part. The statement was, a couple of people said that the existing rates are not fair because the person who causes the high peak load is paying the same rate as a person who is not causing the high peak load. And so we are in a sense eliminating an inaccuracy of the existing rates by going to these new rates. And certainly that position was brought up by a

couple of the people.

Then there were some others who said the opposite. They said it is unfair to charge customers a higher price because that's their lifestyle and that's what they have, you know, gotten used. Buying their equipment, running their life and they don't have the flexibility. So by charging them a higher price you are penalizing them and that's unfair.

So it was that person being compared to themselves. So they didn't like the higher rate compared to the lower rate during the peak hours just themselves. But when you compare them to other individuals I think it's an intra-class, inter-customer subsidy question.

And when you take that broader look there is no doubt that it is certainly that existing rates hide that unfairness. But I believe what allows people to get into, and I've had these discussions both with these interviewees and elsewhere, when it gets to an issue of fairness the status quo becomes the starting point.

And so it's a question of when you move from that status quo and you make at least one

person worse off, even though it might be fair, that one person is now worse off. And if that one person gets ten others to go along with them now you have a special interest group. They will rail against change. So we are imprisoned by the status quo. The status quo comes in as the best thing and any change from that is necessarily bad.

If that is the optics then it's not a fairness question. And I think that that's probably the wrong way to look at it but a lot of people look at it that way.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Commissioner Rosenfeld had some questions.

ASSOCIATE MEMBER ROSENFELD: Or observations. First, Ahmad, thank you, your white paper was very helpful. You managed to be very thorough and yet keep it under 100 pages, which is definitely the limit of my attention span. So thank you.

Three just factual observations. The first one is partially directed at Commissioner Geesman who questions the original $30 million for the meters.

DR. FARUQUI: Art, I can't hear you very well.

ASSOCIATE MEMBER ROSENFELD: Sorry. Thank you, Ahmad. There is the question of was the original $30 million for the meters for the large customers a good idea. I just want to point out that you didn't point out that when the meters were installed the customers were put on default time of use pricing. So a lot of the gains have appeared uncountably because people have undoubtedly responded to time of use pricing, to high prices on hot afternoons, every afternoon in the summer. So some of the low-hanging fruit was just captured without any programs.

ASSOCIATE MEMBER GEESMAN: How granular are those time of use rates, Art?

ASSOCIATE MEMBER ROSENFELD: I think that they go up from like 10 cents a kilowatt hour to maybe 20. It's significant.

Okay, the second point has to do with the same hardware point with respect to the Statewide Pilot Project. The Statewide Pilot Project actually had subclasses. Most of the testing was done with meters and critical peak pricing and that, John, was like 300 percent. It was up to 75 cents on the critical peak days. But there was no hardware given to the customers, they

weren't given gateways or programmable thermostats.

ASSOCIATE MEMBER GEESMAN: Right.

ASSOCIATE MEMBER ROSENFELD: The state plan as we envision it now under AMI, and certainly under Title 24, there will be both the smart meters and the critical peak price offering. But there will also be programmable, communicating thermostats.

Now that part of the state pilot got twice the response that you're mentioning. It had a very crude summary in the state pilot in an air conditioned house in Bakersfield or whatever was like one kilowatt of response just from the pricing without any mechanical or electronic control help, but like one-and-a-half or two kilowatts if there were controls installs. So we will actually get better results from the statewide implementation than you said from the statewide project, I'm fairly keen on that.

The other point, if I may make it, the Statewide Pilot Project --

DR. FARUQUI: Commissioner, if I could follow up on that second point.

ASSOCIATE MEMBER ROSENFELD: Go ahead.

DR. FARUQUI: I think what you are suggesting is that the impacts might be even higher than the impacts that were observed in the pilot as the technology enabling penetration expands. Did I get the point?

ASSOCIATE MEMBER ROSENFELD: That's right, yes.

DR. FARUQUI: Yes, okay.

PRESIDING MEMBER PFANNENSTIEL: But only if the rate design follows.

ASSOCIATE MEMBER ROSENFELD: Yes, without any rates people won't respond. The other thing is, if I might put in a plug for the statewide pilot, it was not only very popular, 80 percent of the people wanted to stay on the pilot after the first two years. And I think 80 percent of the people ended up saving money.

The pilot was designed so that if you didn't respond you came out unchanged, the reductions off-peak took care of the higher price on-peak. But people did respond and 80 percent of the people did save money.

That is independent of saving all the money from not having to acquire higher priced electricity, the real go that you mentioned.

DR. FARUQUI: Yes.

ASSOCIATE MEMBER ROSENFELD: The last point has to do with the difficulty of getting people voluntarily to move on the critical peak pricing. Unless you make it a lot sweeter I think than it is, which I think we can afford to do.

I just want to make this obvious point, arithmetic point, that we are only proposing to have critical peak pricing one percent of real time. If you adjust the rates so that the person who doesn't respond comes out even, and if somebody cuts his electric bill to zero, which we are certainly not suggesting during critical peak times, the most money you are going to save on your annual electric bill is a couple of percent.

It's sort of -- From the customer point of view it's about equivalent to wondering whether you should bother to pump up your automobile tires. You know, if I keep my tires inflated I save two percent of my gasoline bill. Nobody does that.

So you've got to make it more interesting than that if you expect people to sign up voluntarily. You either have to think about opt out, which is what we have been talking a long

time, or you have to think about making it more attractive and taking in some of the advantages that you get from reliability. Or both. But that's a problem which I just want to emphasize a little bit.

When we started talking about critical peak pricing rates we thought it was an opt out and we didn't think of having to sell 12 million customers on voluntarily signing up. But I thank you for your very nice paper.

DR. FARUQUI: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Other questions or comments from the dais. I would like to reemphasize what Commissioner Rosenfeld was just talking about, that it really does come down to the rate design. Of all of the opportunities and issues that I heard in your paper, Ahmad, that's the one that still strikes me as the nut that we have not cracked. Thank you, it was really an excellent introduction to the subject and I think there's a lot more to go.

DR. FARUQUI: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Now I guess we'll move on to the panel discussion.

David, you had some changes to the

panel?

DR. HUNGERFORD: I do, Commissioner.

I think this might be -- We are a little bit ahead of schedule and I think people might want to take five minutes, a short five minute break. Then we'll announce the changes to the panel and we can add a member to the panel who has just arrived.

PRESIDING MEMBER PFANNENSTIEL: All right, I will make it a short ten minute break since five minutes never works.

HUNGERFORD: Thank you.

(Thereupon, a recess was taken off the record.)

PRESIDING MEMBER PFANNENSTIEL: I think we are ready to begin now with the panel discussion. Would those in the back please either step out into the hall or take a seat.

David.

DR. HUNGERFORD: Thank you, Commissioner.

We have a number of distinguished guests here with us today who have agreed to come to talk to us about some of these issues. There is going to be one change. On the morning discussion Mike

Oldak from Edison Electric Institute is going to be making his presentation in the afternoon. So we will start this morning with Lynda Ziegler of Southern California Edison.

MS. ZIEGLER: Are we going up there or?

PRESIDING MEMBER PFANNENSTIEL: Lynda, wherever you are more comfortable. Would you rather sit?

MS. ZIEGLER: That's fine, whatever, whatever works.

Thank you for inviting me and thank you for having this panel, I recall back in 2000, I believe it was 2000, Ed Fong and I were in the governor's office talking about the meters for the 200 kW customers. So we have much history and passion around this, this topic. And also Commissioner Chong, our advanced metering filing will come in July so we are right there as well. If we're approved we will begin installing the meters in 2009 to be finished in 2012.

So I want to talk to -- And I think through the day you are probably going to hear very similar themes, I think, from all the speakers. I resonated very much with the barriers and the issues that we saw in Ahmad's

presentation.

When we look at the demand response I think we really need to call it an imperative. And I just want to talk for a minute about our service population Our customers are going to grow by about eight percent. Our population will grow by eight percent by 2010. In the past three years our peak load has increased 13 percent. That's huge.

Also the greenhouse gas has become a huge issue. None of us are very clear about how we're going to meet those goals and comply with that so that's another reason why demand response is really important. So from the state standpoint as well as from the utility operational standpoint demand response is really important.

We were talking at break about our air conditioning cycling program that we're working on to get more megawatts by this summer. That was instrumental last year when we had that horrific heat storm. We had transformers popping all over the place and we used that for circuit relief in areas where we were overloaded.

That particular program doesn't count towards these goals but is an important piece of

demand response and is very valuable as well. You want to go to the next, the next slide.

The point I want to make here is we clearly see the peak growth. But frankly during the energy crisis we were able to respond. People responded. You see that dip in the peak demand in 2001 and people responded.

What I find when I talk to customers, and this goes to the barriers, they'll respond if there is a crisis. If they think that this demand response is being called on to help keep the system running or to provide relief they will be happy to do it because they want to be part of the solution and part of the community. They really only want to do it when it's really important in a crisis.

We talked a little bit earlier about pricing. When you talk to a customer about like the -- what is the name -- demand bidding, thank you. The demand bidding program where customers get paid for what they reduce on that particular day. So we'll call it a day-ahead. We'll say, tomorrow, you know, will you reduce, will you commit to reduce, and they sign up on the web site, it's really simple, and then the next day

they reduce.

Well what they tell us is for a couple of hundred dollars or whatever they get reduction for the bill, and it's not much more than a couple of hundred dollars, it is just not worth it for them. It's not simple, it's not straightforward and the money isn't what drives them.

So I think in terms of the future design of programs as well as, and I think Art this is a little bit to your point earlier, we need to make it worth their while. we need to make it simple and I also think we need to make it fairly automatic.

The kinds of controls that you're putting in the standards and the kinds of controls that in the commercial market are available today are, I think, what we need to be providing customers so that they don't have to run around and do things. That when that price signal comes in that it automatically happens. Because they are busy running their business. They don't want to be running around worrying about turning off lights.

I'll give you a bad example. We have a fairly old building, our general office, and we

clearly try to live our principles. So when there's a peak time our porters go around and physically turn off the lights in the garage. Now we do that because that's something that we feel is important and part of our commitment and we're working to automate that but most companies are not going to send their porters around to turn lights off during a crisis. So we really need to get the pricing signals and the equipment in place to make this work.

In the residential -- And this was one of the barriers Ahmad talked about. Clearly in the residential and small business market we do not yet have the technology to do this. However with the advanced meters we will have the technology. With the advanced meters we will be able to communicate to the thermostats.

In addition the appliance manufacturers are making their higher-end appliances ready to receive signals. So once the meters are in with the communication devices, as we grow this over time we'll be able to have appliances that will get signals from the meters. Pool pumps, pretty much everything we'll be able to communicate with. So when we get to the advanced metering deployment

we will have the technology available.

The issue becomes the customers and are they motivated to take the actions and to do what needs to be done. And that I think is one of the real keys here. I think, and I was talking at break, my opinion is that one of the key burning platforms that is going to help us move this along is the greenhouse gas issue.

If you look at, there was a Gallup poll recently and about 70 percent of consumers said they would be willing to pay to help reduce greenhouse gas. That is a huge shift, a huge commitment. So what I think we need to do is to tie the demand response and tie these to the burning platform of greenhouse gas to get the consumers interested in doing what they can do and doing their part.

Because we have -- And I can tell you on the large business side with the existing programs our sales people have goals around the programs. they have been out to their customers multiple times selling these programs again and again. So I think we have made a really concerted effort to get customers to sign up and they need that. The burning platform, the reason to do it and the

simplicity of the program together.

I really think we can do this and the reason is we have been looking at this and really trying to figure out what are the key messages and the key pieces that will work for our advanced metering to really get the demand response that we want. And we started looking at what are kind of historical things that have happened.

And if you look at the recycling, that's a very good example of how we were able to move consumer behavior. If you think about it, back in 1970 about six percent of our waste was recycled. So public policy came. In 1976 there was the Resource Conservation and Recovery Act. By 1990 16 percent of waste was recycled. Then in '91 there was another federal recycling order and by 2005 32 percent of waste was recycled.

So the way I think about this is to get success is you have got to have a combination of three things. The public policy, and I think in this case the public policy piece is really a lot around the pricing. That's where the public policy I think is going to help drive this.

You need to have the technology, which I think we've all acknowledged that is moving

forward with the advanced metering. I don't think we have a great saturation of the technologies that need to occur here in the business market. You have certain businesses who are very forward and have the technology, the vast majority of them don't.

Recently I went to a tour of a Toyota plant in Torrance. That is a platinum LEED standard building. And what they have done there is incredible and amazing. They have a corporate commitment to being a green company. They have solar panels, they use recycled water for their gardens. I mean, they have really made a corporate commitment and they have the technology. The technology exists. But without people having that commitment to take advantage of it it doesn't get dispersed and saturated.

And then the third leg of this is the consumer education. One of the things that we often short shrift when we come out of a regulatory proceeding is the consumer education piece. There's arguments about cost effectiveness and all these machinations around these formulas so if you say, and by the way, you need a lot of money to educate people, that's not looked at as

part of the program or it's looked at as taking away from the program.

My opinion is that that is probably as or more important than the program itself. What we find is, particularly in the residential consumer, they have absolutely no clue about how energy is used, what a kilowatt hour is. You know, how much does it cost, what does a refrigerator use. Even with everything that has been out there, there is still a great deal of consumer confusion over electricity.

So part of making this happen is to really educate consumers on what is a kilowatt hour. If you turn your coffeepot on, you know, how much is that using and how much does that cost. That is really a huge key.

And we pointed out -- Ahmad talked about the Statewide Pricing Pilot, which was very successful and showed that customers would respond and that we got elasticity. We spent $700 to $800 per customer on customer education. So will they respond, will they do it, yes absolutely, but they first have to understand it before they'll do it.

So I think if I go back the three things we need is the public policy, we need the

technology which is available but not saturated in the market yet, and we need the consumer education. Those three pieces really help overcome, I think, most of these barriers that we saw. David, the next slide.

In terms of the policies I think we are beginning to move to solving some of those. The OIR on cost effectiveness I think is going to solve some of the concern about, you know, how do these programs fit into the overall supply portfolio and are they cost effective, which programs should you pick. So I think that will help greatly.

The other policy issue I think that confuses people is energy efficiency and demand response. I have a long history in this world so I know how some things happened. Years ago energy efficiency and demand response was together, funded together, marketed together, done in the same filings in the regulatory environment.

At a point in time when legislation was passed to put the energy efficiency funding in place they were split apart and demand response was looked at as a stepchild and for many, many years was not funded.

So what happened was energy efficiency still moved forward, it waned a little bit and came back. Demand response, we were -- actually when I took over the group I was getting ready to disband the group, turn the programs down. Because when we moved into restructuring and deregulation the thought was we wouldn't do these things anymore. So when I took the group over I was basically getting ready to disperse those people to other places.

So we built demand response back up from that point in time but it hasn't had the same emphasis as energy efficiency. It hasn't had the same policy interest and it has kind of gone back and forth. We've changed programs several times, which is very difficult for customers. They come to us and go, another contract we have to sign because we have changed the program over time.

So part of the policy is getting the cost effectiveness in place. Understanding that this is a priority and that we want to, we want to make it continuous and not go up and down.

The biggest damage that we have and I hope we'll hear that from the customers later, is when we are interested in something and then we're

not interested in something and then we're interested in it again customers lose faith about it being a consistent policy. And they are very skeptical to invest or to sign up for things that they think are going to go away again.

So I think from a policy standpoint moving forward elevating the demand response to the same level as we think about energy efficiency. I know it's part of the top of the loading order and we look at it in that regard but in terms of focus, regulatory focus, it hasn't had the same continued focus from the policy people as energy efficiency has. So I think that's a key that we need to do.

And I do think that the greenhouse gas, the interest in the public, the interest in all levels of policy makers is really an opportunity for us to overcome a lot of these barriers that we have for demand response because it helps to provide the customer a burning platform to move this forward. And that coupled with the right policies in terms of consistency and continuity, the right pricing policies because that's the key here, I think we can really make this successful and move it forward.

There is great potential out there but we have to have all of these things in place in order to take advantage of it.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Lynda. I just have a couple of questions. Where within Edison does demand response fall? Is it considered a customer service program or a procurement program?

MS. ZIEGLER: It falls in both. I am responsible for it in terms of program implementation but we also have people in our procurement group that are dedicated to demand response and are matrixed over to our organization.

So we have persons dedicated in the energy resource side that focus only on working with demand response making sure it gets into the mix, looking at how it fits into the mix. So we've got it in both. I am responsible for the program design, the program implementation and the customer service. And then we integrate with the people who are dedicated to demand response in the supply organization.

PRESIDING MEMBER PFANNENSTIEL: So if you're, if Edison in meeting your quickly growing

peak, looking at options for meeting that peak, demand response would be up there with investing in a peaker, for example.

MS. ZIEGLER: Yes, yes. I think one of the things that I think we need to get experience on is, and this was one of the points that Ahmad made. When you look at the price response programs, you know, we have, I think we have 200-and-some megawatts signed up. So you look at that and you say, you have 200 megawatts signed up.

When you say, tomorrow we want to have an event and then customers go on the website and sign up for it, we have gotten I think 30 to 40 megawatts sign up to reduce the next day.

So when you look at system planning and you want to say, you know, in five years or ten years what kind of supply resource do I need to have, what we look at is, we have 270 signed up, we know we're going to get 30 or 40. So in terms of supply planning we're planning for the experience of what we get as opposed to what is signed up.

PRESIDING MEMBER PFANNENSTIEL: Right. But that may be a program design or rate design issue there.

MS. ZIEGLER: I think --

PRESIDING MEMBER PFANNENSTIEL: For that specific program.

MS. ZIEGLER: I think that's part of it. But I think the other part is that over time we need to use the programs more and get good experience about, you know, tomorrow may be a critical -- say you have a cement manufacturer signed up and he's got 100 megawatts. He may be in a critical piece in his business and so maybe he signed up for 100 but tomorrow he's got a critical business problem and he is not going to respond at all.

So the price responsive program, what we need to get for the supply planning, is the experience of how much actually responds over time. And then that's, you know, that's just like a power plant. Right now I think we don't have enough experience with those kinds of programs to know what we can get and we do need to tweak the programs to make them more attractive and more simple for customers.

PRESIDING MEMBER PFANNENSTIEL: Right. And I was actually thinking about it in a slightly different way. You were talking about the

spending on the funding for these programs waxing and waning over time. Yet clearly your procurement goes on day in and day out and year in and year out and you don't ask customers whether they want to pay for the new peaking plant that you're building. You in fact spend it, spend whatever you need to spend because it's necessary, and then pass those costs through as something necessary to do business.

And if you're looking at demand response as a supply option, or an option to supply, then it would be the same way and you would use it kind of as you would a procurement option.

MS. ZIEGLER: Absolutely, absolutely.

PRESIDING MEMBER PFANNENSTIEL: Any other questions?

CPUC COMMISSIONER BOHN: Yes.

PRESIDING MEMBER PFANNENSTIEL: Yes, Commissioner Bohn.

CPUC COMMISSIONER BOHN: Just one. You're the perfect person, I think, to ask this question to and it's more philosophy, I think, than science.

In the course of your educational programs one might anticipate a reaction that

says, I'm okay if you convince me but I don't want you to get into my house and you control from outside whether my air conditioner is working or not. I'll make that decision. If you can convince me that's okay or in the greater good, to your point about greenhouse gasses, okay.

Does that discussion ever come up in your experience? Do people actually kind of make that distinction on their own?

MS. ZIEGLER: Absolutely. Almost every time I present advanced metering and the capabilities to a group somebody will bring up, well, you know, customers don't want you in there controlling their appliances.

So what we plan to have is options both sides. Some customers, many who work, want someone else to control it and will sign up for programs that say, utility can set the thermostat up or, you know, turn the refrigerator off for an hour. Others will want to control it themselves so what we want to have is the technology for them to be able to do that and then they can choose whether they want the utility to do that because they don't want to be bothered or whether they want to do it themselves.

PRESIDING MEMBER PFANNENSTIEL: Other questions? We'll move on.

DR. HUNGERFORD: Next is Ed Fong with San Diego Gas & Electric Company.

MR. FONG: Thank you. While Dave is bringing up the slide I'm going to take a couple of minutes of reflection. It was a little bit like old home week here. We go back quite a few ways with quite a few folks here in this room on demand response. I believe all the way back to the year 2000 and 2001.

So with that I want to say SDG&E really appreciates both the CPUC and CEC elevating, elevating the whole issue of demand response. And I mean elevating within our organization.

Commissioner Pfannenstiel, you had mentioned, you know, what do the utilities think? Let me tell you, it has been an uphill battle within the utilities to elevate demand response as a tool. And this means both on the consumer side, that is the demand side, and on the supply side.

So we do thank both Commissions for doing that. It is a battle and I think it is something that we will have to continue to do internally in terms of education.

With that being said I'll speak to a few things that Ahmad brought up. it is unfortunate in many ways when we talk about changing either social policy, public policy or economic policy it requires a crisis. And demand response was a buzzword. It is a buzzword that started as a result of the energy crisis in California.

I'm with Linda here. What we're afraid of is that it will wane and we don't want that to happen. Because as Ahmad pointed out, we ware somewhat comfortable at this particular point in terms of energy. And so with that being the case we can't let the whole issue slide and I think this workshop is representative of both commissions here not letting that happen.

A couple of things to say about the white paper that Ahmad has put together here. I think it's eloquent and it's comprehensive and it's short. I'm with Commissioner Rosenfeld here. I was able to read it over the weekend and usually 100 pages or more I put it aside.

With that being said I think the following points are to be made. I believe there would be very little if any disagreement. And Ahmad has made these points, several of these

points, but I'll reiterate them.

So next slide, Dave. A few things to be said. DR programs for the large customers, I mean C&I customers, it's still relatively new. Let's accept that as a fact. And with that being said it's a new concept. We've had a limited number of event days that we've actually executed these DR programs and the lack of those event days leads to a whole slew of issues about measurement and evaluation and the expected demand response. It has been difficult to measure.

And with that we haven't really sort of fixed on the methodology because we don't have the data yet on the correct protocol for that measurement. So that's something that has to be worked on.

The second point to be made is, and Ahmad has talked about this. I call it customer acceptance or adoption of DR rates or programs. It's limited and it's limited in the very thing that Ahmad talked about, it's limited to the C&I customers at this point. And with some interruptable programs, particularly AC cycling to the residential customers. That's a fact and I'll come to that, it'll lead to several other things.

The third point, very little dispute in the industry here. Demand elasticities for the residential customers on average are much higher than the C&I customers. And I am talking about a statistical difference and an actual difference. Let me give you an example.

For C&I customers demand elasticities usually range when you look from study to study of .02 to .05. On the residential customers the demand elasticities range from about .08 to possibly up to .2 depending on the study. So they are two or three times greater in terms of price responsiveness for residential customers than it is for the C&I customers.

Ahmad talked about the potential. The potential for the demand response impact and the benefits from the residential segment is much higher than the C&I segment. This is the potential. We haven't realized it yet, we haven't put it in place but that's the potential.

With that being said if you look at SDG&E's load profile about 40 percent, 45 percent of the peak demand actually comes from the residential sector. So it's not a small amount, almost half.

And the adoption rates that you look at from the C&I sector. I don't think you can take that and infer too much as to what will happen to the residential sectors. The customers are different, they view the world differently, they view energy differently. And their energy education at this point, as Linda pointed out, is very, very low.

Fifth point. Ahmad made this point and this leads to target marketing. From the Statewide Pricing Pilot 80 percent of the demand response from the residential customers in the SPP came from 30 percent of the customers. What does this mean? The conclusion that you look at is that you don't have to market and educate everybody because not everybody will provide the same value in terms of demand response.

This is a target marketing issue, a customer segmentation issue. Something that we need to explore a lot more. That is, you have to differentiate the messages depending on the customer segment that you are going to market to.

The final point here to be made, quite clear, this is a factual point. The five percent goal is not attainable in 2007. With that being

said, we looked at the five percent goal as sort of the day-ahead program. I think we need to rethink our concept a little bit and talk about not just the day-ahead programs but price trigger programs, which could be same day. And that will lead to a few recommendations that you'll see.

With that, next slide. Just to squeeze in a note here. SDG&G has, as Commissioner Chong had pointed out, in its GRC, we have filed our GRC phase two. It does contain a dynamic rate proposal both on the residential side and on the commercial and industrial side.

For the third time now we are proposing a default, opt-out CPP rate for the commercial and industrial customers. It's dependant upon size but this is the third time. And of course it's the third time that the CPUC has directed the utilities to file that. So maybe at some point, you know, you take three swings at it, hopefully we can maybe we can get a single or a double. Maybe not a grand slam but we'll go for a single or a double at this particular point.

On the residential side we're proposing, and this is trying to address some of the issues, providing incentives to all the residential

customers to reduce during peak time. We call it the peak-time rebate rate or program. And to make a bottom line, we're trying to comply with AB 1X, which Ahmad has pointed out is a constraint.

Still have that tiered structure. Whenever it will end. Still have that tiered rate structure but provide incentives to all residential customers without having the need of the residential customer to enroll, that is sign up for the program. That is, if they reduce during the critical peak times then they will receive an incentive that is a credit to their bill.

I'll quickly move to a couple of other points here. It was raised this morning by Ahmad about AB 1X and fairness issues. A couple of comments there upon fairness. Without repeating what Ahmad has put in the white paper and what he talked about this morning, I think one thing that the Commission, both Commissions from a public policy viewpoint need to think about. And that is possibly whenever AB 1X rate constraints come to an end rate shock issue.

At some point you're going to move from point A, that is the status quo today that Ahmad

talked about, to a new rate structure because the restraints will come off. How will we do that? And it is a big, public policy issue that we would need to wrestle with. We either wrestle with it starting today or we wait for when we reach that cliff.

And finally, in terms of recommendations here. Some things are quite obvious and that we're already moving ahead with and that is implement smart metering AMI as quickly as possible across the state. A few things that we see as continuing discussion in the public policy arena and in our cost benefit M&E type of testing that we need to resolve.

If we state in the energy action plan that demand response energy efficiency is higher in the loading order than generation than at some point we have to make a statement that the value of demand response, that is the kW per year value that you put on it, is higher than avoided generation.

You don't do that, it's inconsistent. it's just inconsistent of what we stated in the energy action plan. And yet we have several, even in SDG&E's AMI proceeding, tremendous debate about

that. At some point it is going to have to stop if you want to be consistent with the loading order.

Ahmad pointed this out. If we are going to look at cost effectiveness tests and measurement and evaluation, which means looking at both the impacts, that is how much demand response you get, and the benefit from the demand response, I think you are going to have to find a way to incorporate even an existing SPM methodology. The issue of the level of service that Ahmad brought up, the economic surplus calculation that Ahmad brought up, and the hedge or option benefit that you get from demand response.

Finally the last two points. And this is where I want to really thank the Public Utilities Commission because we did not include it in our original AMI filing. And that is leveraging what is emerging right now, called home area networks. And this is addressing some of Linda's points here.

You have to make, on the residential side particularly, demand response, the action or behavior for demand response fairly transparent for the customer. And with home area networks out

there and the devices attached, whether it's a PCT, a programmable communicating thermostat, whether it's other appliances attached to it, you have to make it so that it becomes automatic if it's triggered by price.

And of course the customer ought to have choice. This is what you were raising, Commissioner Bohn. Where the customer ought to have choice in when he triggers an action or behavior on his part but he can do it automatically if he sets the price triggers himself. So leveraging the home area network for demand response, and I would also say for energy efficient technologies. You get the benefit for both.

The other point that is made I think, we already have quite a bit of technology that is being deployed today. Unfortunately we have classified as on the interruptable side. This is the AC cycling. this is even the current programmable communicating thermostats there. We have classified them as interruptable programs.

I think we need to rethink that. We need to rethink that. We need to rethink that and think how we would apply, have those programs

applied with a price trigger. That is a same day price trigger. And in that sense it will be much more consistent with how Ahmad has defined demand response as a price trigger behavior or change.

A few things after my discussion about the facts and conclusions. We need to focus on the residential side. We have not done that. Our focus in the last few years has been on the commercial and industrial side. As a matter of fact the large commercial and industrial customers.

Without beginning to think how we would communicate, educate with the residential side that is a big market that we will choose and it is better to begin sooner rather than later.

A couple of questions were raised by various Commissioners here and I'll add some insight here. I think on the energy side the challenge for us in terms of customer education is changing our perception of energy. Today our perception of energy does not apply the time dimensional aspect or attribute to energy.

When normal residential customers turn on a light, kick on the air conditioning, have their i-pod plugged in or their home entertainment

center on they don't think about that time dimension. That it is a different value one part of the day versus another part of the day.

That education must begin, otherwise we stick with -- the public policy is that we don't want them to think about it, they just stick with the flat rates. And I don't think that's what we want at this particular point.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Commissioner Geesman.

ASSOCIATE MEMBER GEESMAN: Ed, following up on your last point. It seems to me we have dug ourselves a pretty deep hole in terms of avoidance of that time dimension for as many years as we have successfully avoided it.

Commissioner Rosenfeld characterizes time of use rates as pretty large blocks for I think five or six hours a day for four or five or in some instances I think six months of the year. that is not a very fine level of definition given what we know to be a much higher variability in cost based on when electricity is generated and consumed.

You referenced Ahmad's paper and

presentation quite q bit in your presentation. One of the things that he concluded with was the degree of cross subsidy that exists. I believe he said, intra-class and inter-customer. How big a concern do you think that should be for state policy makers?

MR. FONG: On the intra-class subsidy what we have right now on the residential side is that tiered rate system. And what ends up happening there, if you take a look at the SDG&E residential use, about 70 percent of the actual kWh, the kilowatt hour usage, is under the 130 percent rate cap from AB 1X.

So it's really a 30/70 split in the subsidy here. Essentially 30 percent of kilowatt hours on the residential side, right, are subsidizing 70 percent of the kilowatt hours. That's one way to look at it.

Now whether that is fair social policy, public policy, or not, I think that's the item that needs to be debated over time. So in that intra-class that's just the statistics, the facts in terms of the intra-class subsidies.

In terms of interclass, I tried to address that. That's between what I describe as

the different segments, the residential segment, the business segments, the commercial and industrial segments and so forth.

What ends up happening there is because as we look at rates in the future we have much more flexibility on the C&I rates than we have on the residential rates. So what ends up happening there is that you end up -- within the C&I class you have less cross-subsidization than you had within the residential class.

But across the residential to the C&I class you have that subsidization happening just because of AB 1X and the 130 percent rate cap. Some of those costs, the incremental costs that we have, that are covered under the rate cap must be covered in terms of revenue requirements from both the C&I customers and the upper tier, what we call the tier three, four and five on the residential side.

The concern is there but I think Ahmad raises the best point. That's the status quo today. What is the public policy to move from the status quo, point A today, to what we think from a public policy viewpoint to be the to be environment, to the target environment. And that

is the political, the social and the economic discussion that has to happen.

ASSOCIATE MEMBER GEESMAN: I guess the concern I have is we design these programs, and certainly the way you and Linda described your programs, we're trying to motivate good behavior. We're trying to figure out what carrots can motivate the saintliness that exists within all of us.

It strikes me that from a state policy standpoint you could look at the inverse of that perhaps more productively. That we're trying to prevent bad things from happening. We're trying to reduce if not eliminate cross-subsidies that distort price signals. And that might provide more of an imperative for state policy makers to get moving on this.

MR. FONG: Commissioner, I think that's -- I actually took a note from Ahmad when he started talking about the disconnect between the retail and the wholesale market. It's an interesting question when you start talking about price signals. What can we have?

And this is what happens with rate design. When we do rate design we're sending a

retail signal to a customer, so the question, and I don't have the answer because I have it as a note to think about. From a proxy price signal viewpoint what is the -- it is not a perfect price signal because any time we do rate design it doesn't completely represent the real time market of any sort. The market is too dynamic for us to do constant rate design. It is just not possible to do that. And I mean both rate design from a pricing viewpoint and a rate structure viewpoint.

So with that being the case what we end up doing in the regulatory arena for utilities, we end up setting up a proxy, right, a proxy. And the question is, what should that proxy represent, right. What market should that proxy represent? So when we set rates even on a three period time of use rate structure what proxy should that represent?

PRESIDING MEMBER PFANNENSTIEL: Not to get into a rate design discussion, which would take over everything else that we want to talk about, but it does seem that the proxy, the retail proxy has to reflect or should reflect in it the wholesale cost as well as some, you know, capacity costs, if you will, or some fixed costs that vary.

And we used to do marginal cost rate design efforts and then take those and adjust them to meet a revenue requirement. I don't know if that is still done. But that certainly gives you the idea of how they might vary.

How is demand response looked at at SDG&E? Is it a customer service program or is it a procurement program?

MR. FONG: I knew that question was going to come up because it was asked of Lynda.

From a program administration and outreach point of view it is clearly a customer service program. From a resource planning point of view, that is both the long-term resource plan and the annual plans, we have folded demand response as part of the long-term resource plan. So in that sense it is part of supply.

PRESIDING MEMBER PFANNENSTIEL: So whenever you're thinking about whether you need a peaker, the idea -- the evaluation, the internal evaluation would compare the cost of the peaker against the cost of a demand response program.

MR. FONG: Yeah. I think the challenge is exactly as Lynda pointed out. When we start looking at the evaluation of the peaker versus the

evaluation of the demand response, it's a point that I spoke to. We should put a little bit of a higher premium on the value of demand response than we do on the peaker but we do not.

PRESIDING MEMBER PFANNENSTIEL: Right.

MR. FONG: And that's because when you take a look at the discussions that have gone on that we have litigated we have always argued exactly on the margin that demand response is exactly equal to the value of the peaker.

But what ends up actually ends up happening when you get into the litigation and the discussion there, and this is -- the value of demand response ends up being less value than the value of the peaker. And that's where the distortion comes in.

PRESIDING MEMBER PFANNENSTIEL: I understand that you need to adjust the demand response numbers to make them equivalent in a whole bunch of ways, I guess, relative to the peaker. But I just wanted to know that that was done in every case. That you wouldn't invest in a peaker without making that -- or even a contract to buy power from a peaker without making that explicit calculation.

MR. FONG: No, absolutely. I mean, we look at the demand response and what we could get from demand response programs and the effectiveness of demand response versus the value of the peaker.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

Other questions? Yes, Commissioner Chong.

CPUC COMMISSIONER CHONG: Thank you. A few of you have mentioned that maybe the PUC hasn't put enough spotlight on the DR programs in recent years. So I guess I wanted to say to you, I think we had pretty strong language in our recent decisions but if it's necessary I'm happy to call your boss tomorrow. Then you can send him an e-mail, he or she, that I am going to be calling to tell them that there is a spotlight at the PUC on DR if that will help; happy to do that.

My other question has to do with the marketing of these programs. You know, I think we do have the burning issue that you need for your marketing hook with the winning of an Academy Award by An Inconvenient Truth and the appearance of the former vice president on the Academy Awards, with all this tremendous concern about

green house gas emissions, the governor on the cover of Newsweek with a globe on the tip of his finger. You know, you've got the hook.

So my challenge to you, and perhaps you could briefly address this, is how your marketing departments are going to take advantage of this hook and tie it to your demand response programs.

Because I think there is an obvious tie and it does take, I agree with Linda, that it will take tremendous consumer education. I do think there is a strong group in California that feels very strongly about environmental issues and they will respond.

So my challenge to your companies is, how are you going to do it, how fast can you do it, and can you do it in time for the summer of '07 demand response programs?

MS. ZIEGLER: And I'll take the first part of that because I was showing you this. We perceived early on that this was going to be a burning platform. And we've done segmentation on our customers over the last few years and identified.

We have got a group that is about 17 percent that is an environmentally interested

group that clearly responds to environmental messages. And this goes to Ed's point of targeting messages. We have another group that is proactive conservers and savers, which their burning platform is saving money. You know, they're coupon clippers and et cetera.

So what we do is we try to target the messages based on what is going to resonate with them. So this piece in terms of speed of response, this piece is getting ready to go out for our summer discount plan. And it is offering an environmental, we are going to make an environmental donation per customer who signs up for our air conditioning cycling. It is on recycled paper and really focuses on the environmental benefits of the program.

So we are already incorporating those messages in our marketing because we do think that that is one of the issues that has captured, you know, consumers' interests and will really help move them along.

So what we need to do is go back and incorporate that into that discussions that we have with our business customers as well on the business side of the house. Because as Ed pointed

out and Ahmad, at this point in time, you know, the people who have the meters and the technology are the business customers.

We have, we have met our five percent demand response goal if you count our air conditioning cycling and our interruptable programs, which are not counted under the protocol. So we are at five percent. We're over five percent when you count our interruptable AC cycling and our price response programs.

So the availability of the customers that we can go after with the programs we have, we have the five percent. It's just the goals were set around really trying to get he price response and I think that's what we have all been struggling with is getting the burning platform and getting the customers to really sign up for those. And it's the business customers that we're really having difficulty capturing on those.

Did you want to add something?

MR. FONG: I think what is interesting, during the San Diego energy crisis back in the year 2000 and 2001 from the business customer viewpoint it wasn't the price triggers that ended up pushing them for both energy efficiency and

demand response but it was doing it for the greater good.

And when we, and when we sent the message out about avoiding rotating blackouts I mean the C&I group, the large C&I customers really ended up I call it adopting that approach and program to it. So that message was a targeted message but to come back -- I mean, you can't cry wolf, right, all the time with everything being a crisis. So it's that selective message, that target marketing message, that we need to learn to get very, very good at. Which we're probably not good at today but we have to get better at.

PRESIDING MEMBER PFANNENSTIEL: We're ready to move on. Lynda, did you have another comment before we move on?

MS. ZIEGLER: Yes. I was just going to add a point because I think that the greenhouse gas really does become the burning platform. And I reflect on the businesses that have now signed up and are being very visible. Wal-Mart has taken a big position on compact fluorescent bulbs and really moving towards green. So once you see those kinds of leader companies doing that it tends to spill over to the others.

So I do think that that burning platform is helping us, especially with the high-profile companies that have stepped up. So I do think we have an opportunity here that is going to really help move us along.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Steve.

MR. McCARTY: Thank you. Thank you, Commissioners, thank you for the invite here today.

The timing is very good because, as Commissioner Chong noted, demand response is kicking into high gear at the CPUC and we have workshops starting next month on some of the issues we've been talking about already which is cost effectiveness and measure and evaluation. so the timing of this is really good.

A lot of -- I did not talk to these two people before I came today but what I am going to say is very similar to what they had to say in terms of what we're seeing and what the barriers are and how we think we're going to overcome those barriers.

But to start, PG&E, like Edison, is if you look, if you include all the demand response

programs as counting toward the five percent goal we are basically at our goal. This slide here shows our combination of price responsive programs and our interruptable programs. Those are the last two on the bottom, they're about 325 megawatts. We're at just over 900 megawatts in total and that's actually our five percent goal this year. Of course, about a third of this does not count toward the five percent goal. But if you do count those two we're there.

And Commissioner Pfannenstiel, you asked about where this resides in these companies. As with the other two at PG&E it is part of the customer function but we do work very closely with people in the procurement department. So when we call the programs they know we're calling the programs and they adjust their procurement actions accordingly.

Energy efficiency, sorry. Demand response is a resource but it's a resource that happens through customers taking action. So that's why it's appropriate to be part of the customer service organization with very close coordination with the procurement people.

And the procurement people have as part

of their procurement goals, internal procurement goals every year, demand response goals. So we follow the lading order in terms of the way we plan, in terms of the way we run the company. First energy efficiency, the goals that the CPUC set for us, then demand response. And that is part, that's throughout the company, it's a priority for us.

And we, like the other utilities, look to demand response before we do a peaker. So we follow it up in the planning perspective and an operational perspective.

But we have about 900 megawatts in demand response, we want more. Last summer as you know after the heat wave the CPUC encouraged the utilities to file their ideas for additional programs in case there were another heat storm or just to implement the loading order. PG&E filed a number of programs, most of which were approved at the Commission.

So on top of the 900 megawatts that we have we have aggressive programs basically at all customer segments starting with an AC cycling program that we are ramping up. We do not have one now. We had one in the late '80s that fell

into disuse. We are ramping one up now and we'll come back to that in a minute.

We went out to the market, the second line item here, and asked the third parties, non-utility providers, give us your ideas for demand response programs. This were competitive bid, we got 35 megawatts which is now under contract, which people are in the market selling.

Our demand bidding program, the Commission approved higher incentives and a wider bidding window. We are looking for a greater customer sign-up based on that. We have a program called the Business Energy Coalition, which is a demonstration program which has been very successful. We are expanding that program throughout PG&E service territory.

And this last time is one which is very important. As part of our portfolio the CPUC approved technical assistance and technical incentive dollars for programs and also programs for automating DR. Those incentives were actually increased by the Commission, the CPUC, last November as well as the amount of money we spend on it.

We're finding this is what customers

really want and need. Technical assistance is an audit. A very detailed, a very detailed audit that goes into facilities and looks at all the end uses and looks at where we can get demand response out of that facility. And we co-sell this with our energy efficiency program.

When we go to a customer to sell the demand side you often only get one shot at that customer. So we do energy efficiency and demand response at the same time. If they ask for an energy efficiency audit we will also offer to do a demand response audit. So we try and leverage off the activity that is already taking place.

And then where we can, this is again a very exciting prospect for us, working with the Demand Response Research Center, which is a peer funded group, we are encouraging customers to automate DR so that when they get the price signal from us it automatically triggers the end usage shutting down so it makes it very simple for them.

Because what we hear from customers is, yes, they want to contribute, they want to help the greater good. And now is not blackouts, it's not the threat of blackouts it is concern about the environment. Business customers and

residential customers are motivated by that. They want to help, they want to take action, but they need help to do that.

And this program in particular we're finding a great deal of customer interest as we roll it out. Last year we had about 15 audits to start, we are now looking at over 300 this year. So it is really taking off with our customers.

So how to achieve more demand response? Again, what you heard, very similar to what you heard before. The first thing is, again, it's a resource but he customer has to make it happen to be a resource. We have to have stable programs and we have to have simple, understandable rules.

Because people have lives to live and businesses to run. You are not going to spend a whole lot of time on complicated rules or rules that change a lot. And this was something that energy efficiency and demand response has suffered from in the past that I think we have gotten past.

Energy efficiency, when the electric restructuring policy change took place, was really suffering from starting and stopping. Because the average program approval time from about the mid-90s to 2003 was about six months. That's very,

very difficult to sell the customers because it's, you know, forgive the cliche, flavor of the month.

The same thing is true of any demand program, demand response as well. The CPUC stared on a three year program cycle for both of them, 2006 to 2008 on both of those resources. My strong encouragement would be, let's go to four years next time around. So let's not spend time in the regulatory arena. Let's do the work we have to do there but then let's get out and work with the customers.

Have stable rules that we can sell. Particularly large customers. If you're trying to get them to undertake an investment, say put more demand response functionality in their facilities, you're going to tie into their capital budget cycle, which can be 18 months. So if they know that program is going to be there they are much more likely to act. We found that if we said, the program ends in six months well then you lose interest right away. And once you have lost that sale you have lost it for a long time.

Also, again this a similar theme to what you heard before. Customers need education. Education is sometimes thought of as an

afterthought, it's thought of as a burden on the portfolio. No, it makes the programs happen. It's the way you get customers to take action.

And particularly as Commissioner Chong noted, we have a great theme that resonates and will not go away. Thankfully the worry about blackouts is not with us but the concern about the environment is not going to go away.

We have seen a sea change in the last few years. You never pick up a paper without hearing about global warming. People are concerned and they want to take action. So we need to make that connection for them about their usage and how they can contribute.

And then again to continue the same theme, they want to act but it can't be something that really disrupts their business, destroys the productivity or has a great impact on their life. Linda had the analogy to recycling, it has to be like that.

People will take action when there is an opportunity to do so. For large customers that means automation. For small customers they can start with where their usage is, where the real peak usage is, and that's AC cycling or

programmable thermostats. And I know Commissioner Rosenfeld is looking at that for new construction starting in 2008. We are rolling out a program for existing customers.

And then lastly one thing we're starting, and it's a theme you heard in particular, you have to develop segment-based marketing tools. One of the real advantages to having a utility run these programs is that the utility knows every single consumer's usage. It doesn't have to do market research, it doesn't have to pay somebody. It has that as part of its day to day function.

And so we can look at the load profile for each segment. And we can look at, okay, which of these load profiles best matches our need in terms of our net open and where should we first spend our marketing dollars? What are those customers that best give us that resource fit. So we're starting on that. And then we're also within that, what are the best customers within that segment.

So again we have data which is very, very valuable, that a lot of companies have to go pay people for, do a lot of research for. We have

it as part of our business. And then once we, once we developed those segments that are the most valuable to us, the customers within them are the most valuable to us, we will be able to create marketing materials that show common end-use technologies by segment. Say okay, here is what you have to do.

So we're trying to build the infrastructure within our own company to be able to go out there and efficiently and quickly market to customers and do it in a way that will lower our costs by getting commonality throughout all customer segments.

So again, the same things you heard before, education, simplicity, automation, stability. Again, we're looking forward to addressing the really policy issue of cost-effectiveness and measurement and evaluation as we start building that next portfolio, which will be on us before we know it, and hopefully we can have it even longer than three years.

Three years is great, four years is better. Thank you.

PRESIDING MEMBER PFANNENSTIEL: Steve, do you see then DR going forward as a voluntary

program? Something that we market to customers and ask them to sign up for and build it based on customer willingness to participate. Or do we do it as a, either a mandatory rates or some kind of --

ASSOCIATE MEMBER ROSENFELD: Opt-out. Mandatory raises hackles.

PRESIDING MEMBER PFANNENSTIEL: Mandatory or opt-out. I mean, how do you, how do you see it going forward?

MR. McCARTY: Well, customers want choices so however, however we go forward with the price signals again we would hope it would be not necessarily mandatory, customers do want those choices. But even for a given price signal, again, customers still need help. So it is not an either/or. it is not a question of doing it all through a price signal and therefore not having a program. So however we go forward I think customers still need education, they still need help.

PRESIDING MEMBER PFANNENSTIEL: Oh no, I wasn't taking away the need for customer education or technical assistance or even technical financial help. What I was really thinking about,

you know, again, if you build a peaker for the benefit of customers you don't give them a choice about whether to build that peaker. You say, this is a resource that is the least cost resource for our customers and therefore we'll do it and it will be there for everybody.

And if you have DR programs and maybe they are rate programs and you give customers some choices and you give them maybe an opt-out choice and you give them information on how to respond and you give them technical assistance on how to respond. But the program is there and they have a choice of whether to shift load or pay higher rates if they can't shift load. But you don't, I'm trying to figure out how you would look at that. Whether you see the portfolio being primarily a set of voluntary programs.

MR. McCARTY: We favor opt-out, I guess to answer your question. You have an opt-out program and you have voluntary programs.

PRESIDING MEMBER PFANNENSTIEL: Yes, Art.

ASSOCIATE MEMBER ROSENFELD: A couple of comments. One is on the opt-out issue. I can quote you but end the sentence differently. That

is, customers want a choice so of course we should give them the option to opt-out if they don't like having the input on critical peak pricing as a default.

To amplify that point a little bit, at least I would argue that there is some difference between large customers who already have the meters, who are not on critical peak pricing -- and maybe you, Steve, feel you have to sign them up for there to be pricing. That is conceivable because there's some thousands only of large customers.

The idea of signing up statewide ten million residential customers is hard. One probably wants a different debate about opt-out versus voluntary for large customers and small customers.

I was going to make one other remark. Commissioner Bohn asked about the difference between an economic signal, critical peak pricing a day ahead, and a reliability signal. And I just want to point out the obvious point that hasn't maybe been said at this point. That the same hardware is perfectly capable of handling both an economic signal, and that's what we have been

talking about, the 24 hour ahead critical peak pricing, and an emergency signal.

The way the CEC is proposing for new buildings with the PCT, the programmable communicating thermostat, is that it will receive two different signals. One for ten days of summer it will get an economic signal. And it is overrideable if you're home but you're having a party or you're sick and you don't want to comply you just override the signal.

If on the other hand there is an emergency, usually with little advance notice, maybe an hour or so and for a shorter time, not for seven hours in the afternoon, the thermostat will get an emergency signal. It is not overrideable. In that case you get several kilowatts response and it is completely reliable. And if you don't believe it's reliable try it every hot Wednesday afternoon to convince yourself it's reliable.

And so when it comes to setting goals this is all going to be a big proceeding. But we really have to think about two sets of goals. And they are quite different and I will quote some numbers. And I remember Steve alluded to auto-DR,

the auto-DR program. On a hot afternoon it's pre-programmed and they tend to get I think 13 percent response on a peak load. That's for economic response.

If on the other hand they call for a signal which is an emergency response to prevent a rotating blackout and PG&E in this case sends out a signal which says, we want you to do those things that, you have to do those things that will give us relief for two hours, not seven hours, then I think they get 25 percent response reliably.

So I'm just making the point that we have to think through the difference between and economic response and goals for that versus reliability response, which is pretty darn valuable and certainly comes under procurement. And that's the reliability response. We need to address both. I don't think that's controversial.

MR. McCARTY: And the goals going forward after 2007 are -- that's actually a third thing we're going to discuss in the DR OIR.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

MS. ZIEGLER: Art, I just wanted to add, and I know you and I have talked about this many

times. I am not opposed to a default with an opt-out but that is exactly when we run into the AB 1X problem.

ASSOCIATE MEMBER ROSENFELD: You bet.

MS. ZIEGLER: Yeah. So it's certainly a doable thing but we have got to solve the AB 1X problem to be able to do that. Because at this point in time we're looking at something similar to what San Diego has done for our advanced metering program, the peak time rebate, and then voluntary time of use. Because we can't overcome the AB 1X issue with regards to a default with an opt-out.

PRESIDING MEMBER PFANNENSTIEL: Commissioner Bohn.

CPUC COMMISSIONER BOHN: Steve, you mentioned the utility, I think I heard you say the utility needs to do this. It sounds like what you're saying is that this is less an indicative program or an encouragement program and more -- you seem to have a more activist approach to the utility's engagement in this process than Linda seemed to have in going forward and doing all of these kinds of things.

Did I hear that right? I mean, one

could make a case that certainly in the case of the large companies they ought to do it themselves and it isn't up to you guys. It's up to you to make the options. But one sets up a series of incentives and then Wal-Mart and all these other guys go do it on their own.

It sounded that you are positing a more activist, interventionist approach by the utility. Did I just get that wrong?

MR. McCARTY: Well, what I meant to say was that the utility has very rich data in terms of where the resources are, in this case the demand side resource, that meet its need. It is positioned very well to go find that resource basically through use of its customer data.

I wasn't saying that -- I don't think I was taking an activist role --

CPUC COMMISSIONER BOHN: Is that --

MR. McCARTY: I think we're all on the same kind of page.

MS. ZIEGLER: Yes.

MR. McCARTY: We're not saying -- I'm sorry.

MS. ZIEGLER: Yeah. I think in terms of if you think about integrated resource planning.

And Commissioner Pfannenstiel asked all of us how do we think about this in terms of versus a peaker. I think I probably speak for the others as well that we think the utility is well positioned to do that integrated resource planning.

And then by nature of the fact that we have relationships with all of the customers that we're also in a unique position to be able to offer those programs to the customers. So I think that's what Steve was talking about.

MR. McCARTY: That's what I meant. She said it better.

PRESIDING MEMBER PFANNENSTIEL: Shall we continue on with the panel? The next speaker is Bill Roberts from BOMA.

DR. ROBERTS: Thank you. Can you hear me? I appreciate the opportunity to participate and hopefully help define the state's DR efforts.

I'm speaking from the point of view of the Building Owners and Managers Association of California. Just a word about who BOMA Cal is. They have members who own and operate six million square feet of office space in California.

They manage the energy costs for over

50,000 tenant businesses and member buildings consume at our guess approximately gigawatt hours per year. So our association represents a rather large consumer group.

BOMA members have embraced the state's efficiency and load management efforts I would say to the extreme. They have adopted cutting-edge management practices. It is now a badge of perfection for someone to point to their building and how efficient it is. They have invested billions of dollars in efficiency and load managing equipment in building retrofits. They have achieved very significant, and I will emphasize long-term energy and demand reductions.

They have voluntarily also delivered on extraordinary curtailments during emergencies and they actively support the broadening and deepening of efficiency in load management in commercial buildings.

So they have been good citizens and now we're going to disagree a bit with the state's policies on, the DR policies as it relates to the efforts at mandatory and critical peak pricing. Put bluntly, we view the critical peak pricing rate schedules as contrived and they move us away

from cost of service principles.

We have argued that tenant occupied commercial buildings have limited potential for responding to critical peak pricing. Those who can respond will voluntarily. Those who can't respond simply face excessive charges. And a lot of that has to do with the progress that they have already made.

I would like to mention four different categories of barriers, three of which didn't make the original list that was shown by Ahmad. First of all we'll talk about the prior gains in efficiency and load management, which turn out to be barriers to the short term, very short term demand response for a building.

Talking about the tenant leases. Now that restricts the ability to respond. The lack of investment in load shifting technologies and load control systems. And finally Rule 18, and in San Diego's case Rule 19, that shields tenants from participating in DR completely.

The gains in efficiency that we made over the years have been a result of both the fact that we have had time of use rates and the incentives that have come through the efficiency

and load management programs.

Over the past five to seven years many of these buildings, especially the larger class A buildings, have made some major changes of 20 to 30 percent reductions in their demand. Part of that has to do not only with the differentials in the time of use rates but the fact that they also get very extensive or very high demand charges. Such that many of our members are paying 30 to 50 percent of their total bill in demand charges.

So the incentive for shifting load, the incentive for conservation has been there for many years. And I would submit to you that price response has been alive and well in California commercial buildings for several decades.

So now we have put all of these reductions in load on the table and then ask the question, what is left for demand response? For the short term day-ahead or day of. Let me give you some examples of what reduces this capability. if we put in a new chiller, for example, a modern chiller may have an efficiency such that you will consume half the energy you would have consumed with your old chiller. That leaves half the capability of responding to cycling and so on.

The more extreme example I'll give you is that you go to the Embarcadero Center, they have gone through and they have replaced every 180 watts of incandescent lighting with 3 watts of cold cathode. Now it used to be that that was the standard approach to dealing with emergencies is dimming the lights in the common areas. Where you had 180 watts before you now have 3.

The Commissions need to know that there is a very big connection between the efficiency and load management and then the issues of demand response. Frankly I think it's a matter of too many definitions and too many pigeonholes of categories of demand management that we're dealing with here.

And I would suggest that we take a broader look at demand management in general where we could take into account the gains of efficiency and the gains in load management in looking at the overall picture of managing the load shape in California. We would argue that we need to take a look at the load shape, the entire load duration curve or the entire curve, and how can we best reduce the peak on that curve, whether it be through next day demand response, day of or

something that is long term and lasting.

The next thing, the next issue has to do with the tenant leases. Owners of tenant occupied buildings have a much different management problem than the owners of an owner occupied building or single tenant buildings.

They have a requirement, a legal requirement to meet the lease terms and many of these lease terms have very narrow tolerances for temperature settings, lighting levels, and of course they have to live by the ASHRA Standards and other general health and safety standards.

So attempting to shoehorn a critical peak price into these situations leaves many of these building owners with the inability to do much of anything except a higher price during that period, when in fact they may have been an extremely good citizen, made great efficiency gains, and yet we're faced with an inability to respond to the latest policy issue here.

Even the super efficient buildings may not have the load control systems that would be required to do any kind of meaningful response. They can go in and do some manual things on emergency days, which they have done when there is

a true emergency, but in terms of responding to critical peak prices, that is not really a very likely prospect for the especially efficient buildings, for the buildings who all of this efficiency has passed them by and they are still using archaic methods and so on. They aren't going to be able to respond either.

So you need to understand what the customer situation is in trying to craft your rate designs for demand response.

Lastly I'll come to Rule 18. And surprisingly I've talked to very few people in the regulatory arena who understand what Rule 18 is all about. Well Rule 18 says that the owners of buildings, multi-tenant buildings, cannot charge their tenants in accordance with the individual usage of that tenant. So we end up with basically an allocation of electricity costs in high-rise buildings that is based on the square footage of the occupant.

It doesn't take a whole lot of calculations to figure that the small law firm that may have a conference room and a few computers versus the guy next door with a big computer facility, they're just not using the same

kind of power per square foot, yet they get charged that way.

So for equity we need to get something done about Rule 18. Also the fact that they can't see their usage levels. They can't see the costs. They are shielded entirely from any ability to participate in demand response. A simple language change in Rule 18 would expose a very large amount of power, we consider it between 3,000 and 4,000 megawatts, to demand response potential.

A 20 percent reduction of that a wild guess would be that it's about a mid-size generating plant. Yet that issue has been hanging around for years and nothing has been done about it. I will say that we are encouraged that we are in settlement discussions right now with PG&E on that issue and we are very hopeful that with PG&E that will be, that will be settled.

Our final recommendation is take a more comprehensive long term view of demand response, or of demand in general. Align the rates as cost of service and gradually phase in market-based, real time prices. Third, renewed emphasis on efficiency and load management because it works and focus on developing the enabling technologies

that will allow the shifting of load to meet the state's objectives in demand response. And of course fix Rules 18 and 19.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Bill, for your comments. They were, I think, very useful to us in thinking about what are the obstacles from a customer's standpoint.

I am a little confused with your point that demand response moves us away from cost basis rate making.

DR. ROBERTS: Right.

PRESIDING MEMBER PFANNENSTIEL: I would have thought quite the opposite.

DR. ROBERTS: I'm sorry, I said critical peak pricing.

PRESIDING MEMBER PFANNENSTIEL: Critical peak pricing moves --

DR. ROBERTS: Critical peak pricing rate settings. What we have seen so far.

PRESIDING MEMBER PFANNENSTIEL: I see. It's the specific rate schedules.

DR. ROBERTS: Yes.

PRESIDING MEMBER PFANNENSTIEL: Because clearly if you're moving towards time-varying

prices you can't, well you don't have to be but you could be moving much closer to cost causation rate design.

DR. ROBERTS: Yes, and we endorse that.

PRESIDING MEMBER PFANNENSTIEL: And you endorse that.

DR. ROBERTS: Yes.

PRESIDING MEMBER PFANNENSTIEL: And the other point I think is a very powerful one about how much efficiency will the members have already built into their buildings and their operation. But again, on a cost causation standpoint you should be given credit for that and then that would be the starting point and then there would be some time variation on top of that, right?

Demand charges. All your buildings have demand charges? I thought that there was a movement away from demand charges.

DR. ROBERTS: No, well I'm referring specifically to PG&E at the very end but San Diego i believe is introducing demand charges now, which they haven't previously had.

PRESIDING MEMBER PFANNENSTIEL: Not time-differentiated demand charges?

DR. ROBERTS: Yes, I think they are.

PRESIDING MEMBER PFANNENSTIEL: They are, okay, all right. Thank you very much for your comments. Other questions? Commissioner Geesman.

ASSOCIATE MEMBER GEESMAN: Do you employ distributed generation or self-generation in any of your facilities?

DR. ROBERTS: There are some members that have installed it, none recently that I know of.

ASSOCIATE MEMBER GEESMAN: Those demand charges really knock down any incentive to do that I would suspect.

DR. ROBERTS: I really haven't followed that issue.

PRESIDING MEMBER PFANNENSTIEL: Other? Art.

ASSOCIATE MEMBER ROSENFELD: I'll ask you one technical question and then I'll make my main point. How on earth do you replace a 180 watt incandescent with a 3 watt light?

DR. ROBERTS: I would suggest you go talk to Danny Murtagh at the Embarcadero Center who has shown me that the area where he's taken out -- I think he's taken out three bulbs entirely

and replaced one with -- I'm sorry, out of five he's replaced one with a three watt bulb.

ASSOCIATE MEMBER ROSENFELD: Wonderful.

Look, the main problem is the following. You sound as if critical peak pricing involves some sort of baseline and you will be penalized because you have already done the good work. Let me just make sure that we understand.

Critical peak pricing has to be designed so that you pay higher prices five or ten afternoons a week when people want to respond because there is a real shortage and you have a reduction in your bill 99.99 1/2 percent of the time. So that if you don't respond you come out on the average equal, if you do respond you save money.

The results, the best results we know from typical buildings mainly in San Francisco from the auto-demand response is that buildings thought they couldn't respond but when they actually tried it they saved 13 percent on the average of peak load. And when they responded during emergencies they saved 25 percent of peak load. That was a surprise to most building owners but in fact that's what happened.

But the point is, you are not subject to any jeopardy. The other part about critical peak pricing is the opt-out issue. If you don't like it, opt-out. All you have to do is pick up the phone. You sound as if you are being somehow rather having some mandatory rates frozen upon you. Opt-out means opt-out.

DR. ROBERTS: Well I have been through two proceedings on mandatory or default critical peak pricing and it started out as being just mandatory. And in fact the San Diego case I believe is you try it for a year and you'll like it and then you can opt out if you choose to. That to me is essentially mandatory for the first year. That also has --

ASSOCIATE MEMBER ROSENFELD: No, sir, it's not mandatory. I'm sorry, it is not mandatory for the first year. I think there was a perfectly valid point that you don't want people picking up the phone and opting out on the first ten days, particularly if three of them turn out to be hot. So you want people to give it a college try through the summer, through one summer. But it is opt-out.

Anything I've heard of is retroactive

opt-out. If you don't like your higher bills you will be given shadow bills and you will know what you can opt-out to, that's a promise.

DR. ROBERTS: After one year.

ASSOCIATE MEMBER ROSENFELD: But you get your money back.

PRESIDING MEMBER PFANNENSTIEL: Ed, did you want to comment?

MR. FONG: Yes. I was going to say in the San Diego proposal and in our previous proposals there was the first 12 months of bill protection. So what the incentive was, and this is actually addressing Commissioner Bohn's issue in terms of price and choice. So we wanted to put the C&I customers on a CPP rate, they would be protected in the sense that for that 12 month period you would get the lower of the CPP versus their otherwise applicable tariff. Typically in their cases a three period ALTLU rate.

With that being said, the idea was that after 12 months and after the bill protection it's not only a shadow bill, it's the actual bill itself. They can make a determination as to whether they would stay on the default CPP rate or some other optional rate.

ASSOCIATE MEMBER ROSENFELD: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you.

DR. ROBERTS: Commissioner?

PRESIDING MEMBER PFANNENSTIEL: Yes.

DR. ROBERTS: Could I respond to that?

PRESIDING MEMBER PFANNENSTIEL: Of course.

DR. ROBERTS: This does not consider at all the cash flow implications and the extraordinarily high prices that are paid during summertime that would have to be passed on to the tenants and then in the end it gets all fleshed out. It seems like pretty much an exercise that doesn't have a whole lot of substance to it. It almost insults the intelligence of the consumer that he can't do his bill calculation and figure out whether he wants to opt-in or opt-out in the first place.

PRESIDING MEMBER PFANNENSTIEL: Thank you.

DR. ROBERTS: That's the reaction we're getting from our members.

PRESIDING MEMBER PFANNENSTIEL: I think we should move on to Marcel.

For those who are wondering whether we're going to break for lunch, I think we should finish this panel and get that discussion and then we'll break.

Marcel.

MR. HAWIGER: Thank you very much, Commissioners. I very much appreciate the Energy Commission inviting me to participate. I'll try to be brief. I'll try to be a little provocative and I certainly expect Commissioner Rosenfeld will call me on it if I stray way too far from any facts out there in existence.

Let me just say I really appreciate Ahmad's report and the Energy Commission's report and I'd like to sort of key off on two pages that struck me. The first is on page nine where the report discusses the history of the reliability versus the price responsive programs and why the Commission, the Public Utilities Commission, has gone to counting only the price responsive programs towards the goals with sort of a fundamental premise that those kinds of price responsive tariffs will allow customers to choose and to respond to price signals.

At the same time I note that on page 30

just one person noted that the problem is the current low, that was issue 17, low wholesale capacity and energy prices. And I would posit that we have a couple of barriers that are sort of toward to achieving what I would call, you know, demand response that achieves our goals of reliability at lower prices and providing environmental benefits.

And I think there's sort of two other barriers. Actually, why don't you flip through to this third page because they all deal with this issue of price. And on the third page there's some price. And these are not marginal prices but these are prices that -- the column is the average price that Edison saw for power during the three hours when it called it's demand bidding program during the heat wave days in July of 2006.

In the quote Edison indicates that only one hour did they incentive, which was equal to their wholesale price and their demand bidding program reached 46 cents per kilowatt hour. You know, during those three hour averages the highest average was 40 cents. Now that's still more than your average utility rate of, you know, 13, 14 cents an hour but it's not a huge price

differential.

Let me say I think the first goal barrier we have is regulatory schizophrenia. And the schizophrenia is that we have an obsession with price as far as demand response but our energy policy is primarily geared towards reliability.

And we have resource adequacy that requires that utilities purchase a year ahead and a month ahead. The entire goal of resource adequacy is to ensure adequate capacity and the main result of the resource adequacy policies are to depress the differentials in the wholesale market prices in the price that the utilities see, not through the spot market but through their actual bilateral contracts.

And I think part of the schizophrenia is that we seem to be thinking of demand response based on the hourly curves from the PX when 100 percent of the energy was bought on the spot market and we had huge price volatilities. But the reality is that the utilities are being pushed to buy forward precisely to eliminate the chances that we have those same price volatilities that we saw during the PX period.

And I have to say that a second barrier that is related is that there is a certain view of demand response as a price response of demand response as an idea, as a goal in and of itself. Rather than viewing demand response as a tool to achieve other goals.

And I'll say that this, you know I think, Commissioner Pfannenstiel you asked a very good question about where this demand response fit in procurement. And I think what the utilities were saying, but maybe I'll be more blunt, is that when they actually look at, compare demand response to building a peaker under current prices it is never cost effective. So you have this dilemma. If you actually use current prices and cost of a peaker demand response for 100 hours is never going to be cost effective.

So in fact, so what's your choice? Your choice is to artificially inflate the incentives, the capacity payments in the demand response program so that customers make enough money so they'll actually choose to reduce their demand. Because, you know, they are probably not going to do much based on current prices for 100 hours.

And I'm talking big customers now but

then I'll get back to residentials in just a moment. So, you know, that's a bigger issue and since we're about to break for lunch I'll just leave it at that and say, you know, for the residential customers I think these two barriers resulted in this focus on AMI. You know, I'm not going to argue much about AMI because we now have AMI approved for PG&E and SDG&E and we'll see what happens. The question is, are we really going to be paying more than we need to because --

I guess to me the conclusion I have is -- And I think Commissioner Rosenfeld presaged this when he talked about how you have to look at reliability and price responsiveness as sort of two components.

I'm delighted to hear that in the building codes there is this idea of mandating programmable communicating thermostats and having two different signals. When you get to the question of retrofitting existing buildings, you know, I think the AMI push was driven by this ideology of price response and demand response.

Now what's happened though, this is the schizophrenia. Lo and behold the Commission's, the Public Utilities Commission's current focus on

demand response is all being driven by the desire to avoid blackouts if we have more heat storms as we did in July 2006.

Now this has resulted in lots of policies that are all conflicting. We've gotten approval for supply side contracts that are beyond the planning reserve margin. Basically the theory is, let's buy insurance at any price. I think that's the theory.

If you want insurance then why not go down the air conditioner cycling path. And in fact yes, now PG&E has filed an application to spend $360 million on air conditioner cycling. That is going to be all on top of the AMI program and is totally separate from the AMI program.

So, you know, I'll stop there. My slides basically, well. You know, residential customers. The only point in my slides was that yeah, residential customers will provide some demand response. Most of it comes from air conditioning. That's all from the 40 percent of customers who have central air conditioning. We could have achieved that more cheaper I think through air conditioner cycling and we're going to do that now anyway.

So I will stop at that, though I'd be happy to talk about any of those issues.

PRESIDING MEMBER PFANNENSTIEL: Questions, comments? Thank you, Marcel.

MR. HAWIGER: Thank you very much.

DR. HUNGERFORD: Commissioner, would you like to take public comments until 12:30 or would you like to save those for the afternoon? I'll check the phone for comments or questions.

PRESIDING MEMBER PFANNENSTIEL: I think what would be helpful to me is if people in the audience have questions of the panelists, or in fact of Ahmad from his presentation, now would be a good time to do that. And then we'll excuse the panel and break for lunch.

So if anybody here has questions at this point. Otherwise we will just break for lunch.

DR. HUNGERFORD: Are there any questions on the phone?

PRESIDING MEMBER PFANNENSTIEL: I'm sorry.

MS. SHERIDAN: No, there's no questions on the phone.

PRESIDING MEMBER PFANNENSTIEL: All right, thank you.

Why don't we start up again, let's give ourselves an hour and ten minutes and come back at 12, at 1:30.

(Whereupon, the lunch recess was taken.)

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AFTERNOON SESSION

PRESIDING MEMBER PFANNENSTIEL: I'm hoping we can start the afternoon panel without, without having to have the projector on the screen. I think we can use the television for those who are located where they can see it.

Okay, David, are we ready to begin for the afternoon session? Can we begin without having to use the screen? Are there handouts?

DR. HUNGERFORD: Yes.

PRESIDING MEMBER PFANNENSTIEL: We seem to be missing Chris King but other than that I guess the panel --

DR. HUNGERFORD: I apologize for the technical difficulties. Apparently the bulb in this projector is burning out so we were trying to make a shift here and we didn't complete that.

The presentations, for those of you on the phone, the presentations will be available on the web shortly. We're have all those. We can go ahead and do the, we can go ahead and get Ahmad started. I apologize for the confusion.

PRESIDING MEMBER PFANNENSTIEL: Ahmad, are you able to get started without having the slides available?

DR. FARUQUI: Yes. I can just talk from the handout.

PRESIDING MEMBER PFANNENSTIEL: Thank you.

DR. FARUQUI: I suspect most people have a hard copy.

DR. HUNGERFORD: Here we have the handouts.

PRESIDING MEMBER PFANNENSTIEL: Okay. Well why don't you --

DR. HUNGERFORD: They'll be available on the web momentarily.

PRESIDING MEMBER PFANNENSTIEL: Okay, why don't we start then.

DR. HUNGERFORD: All right.

DR. FARUQUI: Hello again. I wanted to make a clarifying comment about market potential number this morning, which was shown as being at 26 percent. And a lot of people came up to me and they said we were trying to average the seven percent for residential with the one percent for small C&I with the seven percent for large C&I and we are not getting an average that exceeds seven percent. So there's some new-fangled math going on here or what is the story?

So let me just make a couple of clarifying comments as to how that number was arrived at. The seven percent number is actually a weighted average number that reflects the residential sector as being 40 percent of the systemwide peak. And the one percent for small C&I reflects a ten percent share for the small C&I system peak. And the seven percent for the large industrials reflects a 50 percent share of that times the 14 percent impact that is being used in the calculations.

So if you add those up you would get numbers around 15 percent. The 26 percent actually included an interruptable rate program that we had taken out that I didn't show here. If you put that in it takes you up to 26 percent. But if you take out the interruptable it goes to 15 percent.

But there was some discussion that I have had with some of the utilities on what are the sector shares that are appropriate. I use 40 percent for res, 10 percent for small C&I and 50 percent for large C&I. Those are based on an ongoing project David is managing.

There is some concern that those shares

might be a bit off so the numbers would be not exactly 15 percent, maybe it could be a little lower or a little higher. But I make that as a clarifying comment so just to keep it in mind.

And of course, you know, it is one of those numbers that is like an upper limit or a potential number. So in all of those numbers there will still be some debate even after you get the definitions pinned down.

Like for example we are using today's technologies to calculate that potential, it's not necessarily using the new technologies that we know will come out in five years, ten years. So those will perhaps push the number to be on the higher side. But on the other side it is assuming that 100 percent of the customers are participating. Which, you know, can only occur in certain implementation scenarios like the default kinds of things. So think of it as a ballpark number. And if you take the interruptables out it is like 15 percent.

MR. BELL: Ahmad, I think that you told me before lunch --

PRESIDING MEMBER PFANNENSTIEL: Excuse me, you need to go to a mic.

MR. BELL: I'm sorry. Ahmad, I think you told me before lunch that the numbers that fed your weighted average as a percentage of each class were 18 percent for residential?

DR. FARUQUI: That's correct.

MR. BELL: And I believe you said seven percent for small commercial.

DR. FARUQUI: That's correct.

MR. BELL: And a 14 percent market potential for large --

DR. FARUQUI: Large C&I.

MR. BELL: And power. And it is those three numbers that weighted together would produce, we discussed, a range of perhaps a 12 to 15 percent market potential.

DR. FARUQUI: That's right.

MR. BELL: And I also wanted to clarify the 18 percent for residential assumes, it's a weighted average of a variety of different participation rates but it assumes that every residential customer is participating in some kind of a program.

DR. FARUQUI: That's correct. And specifically because there are just three other numbers that I can share with you from the

Statewide Pricing Pilot.

The number for those customers who were on just the regular critical peak pricing rate without any enabling technology, that number was 13 percent load drop. So this calculation assumes that 70 percent of the population of residential customers displays a 13 percent load drop.

Then 20 percent go with the enabling technology of the smart thermostat and their load drop is about 26 percent. And there is a small percent small remaining portion that goes with the ADRS technology, the gateway system technology, and there is a load drop of 43 percent. So when you do that weighted average with those shares you get the 18 percent for res.

MR. BELL: But again that's every single residential --

PRESIDING MEMBER PFANNENSTIEL: Excuse me, sir. The people on the phone can't hear if you don't speak into the mic.

Would you identify yourself too, please.

MR. BELL: I'm Andrew Bell from PG&E.

So again that is, the 18 percent for residential, we just wanted to clarify, is assuming that every residential customer

participates in some program.

DR. FARUQUI: Exactly. They participate in one or the other of these three program types and you get 18 percent, assuming 100 percent participation.

MR. BELL: Okay. We wanted to clarify that just because it was such a headline this morning that it appeared that the 5 percent target was only a tiny fraction of the 26 percent market potential. And if the range is really 12 to 15 we thought that gives it a different picture of where 5 percent is with respect to the total.

DR. FARUQUI: Okay, so with that clarification for the morning presentation I want to get into the afternoon presentation, which focuses on where do we go from here.

Regardless of whether the potential is 15 percent or 25 percent or just 5 percent the reality is we have only got 2.2 percent focusing on the price-based programs. So there is a lot of improvement that we want to go after and the question is how best to do it.

Let me make sure. Does everyone have a copy of the slides with them or at least available readily to them? Because it will become very

difficult to follow all of this without at least a heard copy. So if you don't have one maybe try to find somebody else who does and sit close to them, that will make it a little easier on you.

So moving down to slide number two. Slide number two talks about -- I wonder if this has come back. It has come back, wow.

PRESIDING MEMBER PFANNENSTIEL: I think it works on the screen, it just doesn't project to the big screen.

DR. FARUQUI: Great. So there we are. This presentation is in two parts. The first one is called Learning from Other Regions, where we do a quick, vicarious tour of the globe the next several slides. And then the second part is going to be Pathways to the Future.

Despite everything that we have talked about and the frustration that some have about where California is relative to the goals the reality is that California still serves as a global role model in demand response. One indicator of that is that I am occasionally asked to come out to the World Bank and talk about what California is doing.

And that is just one indication of many.

Several people in these town meetings that I held on DR, at town meetings and other conferences they cite California as a leader. And the question is why does that happen? Well, it's probably the only region with loading order and specific goals for demand response spelled out in an energy action plan. A lot of other states and countries do not have anything comparable to the energy action plan. So it gives it immediate visibility and prominence.

Second, this is the frequently cited statistic that you can even find in the Washington Post now and then, is that the per capita electricity consumption in California has stayed constant since the 1970s whereas the national number has risen progressively in that same time period. I don't have the graphs, they are in the white paper, you can look them up.

Even then there are lessons that California can probably still learn as it tries to improve its performance in demand response. And so what I have tried to do in this portion of the program is talk about what kinds of programs are being implemented outside of the state, and do the barriers that I talked about this morning like the

top nine barriers, do they occur elsewhere and if so how do people deal with it?

Okay. Definitely there are demand response programs around the country but many of these are traditional incentive-based programs. According to the recent FERC survey that I think several of you have seen, 234 US electric utilities offer some type of demand response program. But the definition here includes both the incentive-based as well as the price-based programs.

In the incentive-based category -- I notice that this screen took a leave of absence but I think that other one is still on. Direct load control programs are offered by 234 utilities. This includes water heating, load control as well as or and air conditioning load control. You add them together, one or the other, and you get this large number of utilities.

Interruptible and curtailable rates are the next most popular program, of course directed at the large customer market. Then we are followed by programs like the emergency demand response programs that are operated by some companies. Programs that require action in the

capacity market or demand bidding or ancillary services complete the rest.

Moving over to the price-based programs, the predominant program is time of use rates, which we are all familiar with and is not a dispatchable program. It is a static program but it still does create some reduction in peak load. And keep in mind that just the fact somebody has a program doesn't mean they have a lot of customers in the program. A lot of those time of use rate programs have one customer on them, Sometimes two, that's twice as much. So a lot of those programs are there just for the record, not for the demand response savings that they achieve. Real time pricing, 47 utilities have it, critical peak pricing, 25 have it.

Okay, as we go overseas we find a similar kind of separation, price-based versus incentive-based. I won't go into all the details. Basically real-time pricing has been around for a long time in South Africa, in the English market ever since it was restructured. They introduced it as the default rate for all large customers. There are pilots being carried out elsewhere. France, of course, has had a very long history

with these rates.

Time of use rates can be found in Australia, in Finland and China. in many cases these are for the very largest customers, in a few cases they also include residential.

When you come to incentive-based programs they are primarily the curtailment kind when you pay on a performance basis, those are also out there but not as widespread. So it's kind of an interesting reversal of what we see in this country.

But we'll focus largely on price-based programs now in the rest of this survey. The fact that stands out when you look at a price-based program versus the other kind is that it empowers the customer to choose the level of risk that best suits their particular lifestyle or business situation.

So if you look at this graph supplier risk is shown on the Y axis and consumer risk on the X axis. The flat rate, which is the universal rate, just everybody has a flat rate, creates the most risk for the supplier because they buy power in a volatile market and they have to bundle some kind of a hedging product into it and sell it to

the customer.

The customer, of course, appears to have the lowest risk just from a volatility perspective. But keep in mind that doesn't mean they have the lowest price as a result of that. Price is the missing axis here. The average price that they are paying, if you imagine a third axis here. The average price goes down as you go down the front here. Because the more risk you are able to absorb the lower the expected value that you are paying for that rate. We start off with the flat rate.

At the other end you have the real time price, which has the highest risk for the consumer and the lowest risk for the supplier. Not every customer is going to take these rates so one approach has been to offer a menu in some markets that we have looked at and let the customers pick and choose.

CPP is, of course, the critical peak pricing tariff. VPP is an advancement. It's the variable peak pricing tariff where the price in the peak hours is uncertain and it is based on market conditions. So those are the kinds of programs that we have seen and I will say a little

bit more about them as we go through this survey.

Real-time pricing, by which I mean a price that varies on an hourly basis, either on a day-ahead or day-of basis. This program provides the most accurate price signals, going back to a comment that was made by one of the Commissioners in terms of cost causation principles. It comes the closest the cost of power as it fluctuates.

The product is not storable. There are different levels of generation efficiencies and different demand and supply conditions caused by weather and outages and so on. So as that price fluctuates all it is doing is reflecting the changing cost of power.

The participants pay this price, notification is either a day-ahead or an hour-ahead. Larger customers particularly face the hour-ahead prices. Day-ahead are sent out to customers based on forecasts of those prices.

Typically this rate is offered to large C&I customers on an opt-in basis and that is, for example, the case with Georgia Power Company which has one of the largest programs out there.

However, this rate is mandatory in states with restructured power markets like the

states in New York and New England. They have restructured their market, they have functioning wholesale markets, and this rate is the mandatory rate for customers. These are the large customers. They can, of course, if they want, go to other suppliers who can offer them varying degrees of hedge products. But this is what they start out with.

Seventy US utilities at one time or another have offered RTP so it is a product with a long history. Examples include the one I mentioned earlier, Georgia Power. We believe this is the world's largest RTP program, over 1600 customers, peak demand of nearly 5,000 megawatts, load drop in the 15 to 20 percent range and 40 to 80 percent of the participants respond to the changing price level. So there are a lot of people who don't play but there are a lot who do play. So you get the typical, you know, mix of customers.

Commonwealth Edison in the Illinois area around Chicago, they have a pilot with residential RTP, day-ahead notification. There is also a participation credit that customers are given, which represents the insurance that it doesn't

have to be bought by them in order to hedge them because you are facing the full market price.

I will talk more about that later in the presentation. That program was very successful in a pilot form, it attracted 3,000 customers, and it is now being extended to all residential customers on a voluntary basis. And I mentioned the earlier example of South Africa which has the real-time pricing programs for the large customers on a day-ahead basis.

So that is the most sophisticated form of dynamic pricing. the one that is being talked about a lot that probably is the most popular rate design, whether for large or small customers, is critical peak pricing. It provides event-specific price signals. It is limited to those top one percent or two percent of the hours that are really causing that spike in costs and exposes the customers to those known prices infrequently.

It's dispatched just like a power plant would be dispatched. That's what makes it dynamic and that much more valuable than traditional time of use rates. So the participants pay a higher price during the critical peak hours and receive a discount during the remaining hours.

Most rates out there are revenue neutral that are offered so the average customer will be no worse off if they did nothing. And of course if they did something to reduce their peak usage they would be better off.

Critical peak prices out there that we have surveyed range from 20 cents per kilowatt hour to $1 a kilowatt hour, depending on what the reference value is. It typically is four to five to six times higher than the existing rate. It's designed to reflect the cost of a CT spread out over those few hours. The price does rise a lot, it gets attention, and that is entirely its purpose.

It can be layered on top of the time of use rate and/or an inverted tier rate, and that's exactly how it was done in the Statewide Pricing Pilot. So just the fact that the existing rate is an inverted tier doesn't mean that it cannot be done. It can also be signaled on either a day-ahead or a day-of basis.

The critical peak periods generally run from three to six hours. They are designed to capture the peaking hours of the system as opposed to the residential class or the industrial class,

as the case might be. Typically there are 10 to 15 critical events that will be called and that's what is laid out in the specification of the rate which the customers sign on to.

Gulf Power has a program that I think some of you are familiar with called the GoodCents Select program. As far as we can tell it is the only full-scale residential CPP program currently in the United States. Of course that will change once the PG&E program gets underway and programs in other states are also being looked at. But right now it is the only one out there that is a full scale program.

The critical peak hours are restricted to one percent of the year. participants opt into this and they actually pay a monthly fee of $5 to cover the cost of the device and the administration of the program. The program has 6,000 participants. It had that many in the year 2003, the latest year for which we have data, and provided roughly 1 megawatt of demand reduction.

PRESIDING MEMBER PFANNENSTIEL: Excuse me, Ahmad, do you know what percent of the residential class that might be?

DR. FARUQUI: Actually I don't know the

exact number but it's a very small percentage. It's a mid-size utility.

PRESIDING MEMBER PFANNENSTIEL: Thanks.

DR. FARUQUI: They tell me that the customers save about 15 percent on average on their utility bill as a result of this participation after paying the $5 fee. It's targeted, it's target marketed towards the larger homes is my understanding. Their bills are large. And keep in mind that in Florida there's a lot of electric heating so those are significant.

This program works with automation. It's connected to air conditioning, water heating, swimming pool pumps and the electric space heater. So it is like a generalization of the smart thermostat program that was tested in California. It has all that automation built in and to that extent it's getting these bigger impacts.

EDF offers the largest CPP program in the world based on what we have found. Now is that subject to change, you know, with the EU restructuring happening? There is a lot of confusion even in France as to where they're going with this program. I cannot predict where they will be two years from now.

We had a recent meeting with the EDF people and the program is still there but may change. it's called Tempo and it has two daily pricing periods, peak and off-peak. There are three types of days representing the critical nature of the supply condition. They are color-coded to go with the colors of the French flag, blue, white and red.

Blue days are 300 in number, they are lest expensive days. White days are 43 in number and they are the mid-range price days. the red days are 22 in number and they are the high-priced days. Because France is winter peaking their red days occur in the winter. And yes, the colors are the same as the ones of the American flag.

Okay, 15 to 1 is the ratio of the highest peak price to the lowest off-peak price. So it's a big hiked rate with significant escalation as you compare the lowest off-peak versus the highest on-peak.

The participants are equipped with a smart thermostat, there is a day-ahead notification via the in-house display, there is voluntary enrollment and they have 120,000 participants.

Now they have about I believe something like 30 million customers. So it is certainly a very small share of the total but they are targeting the very large homes with this particular program.

Pilot fever has broken out across the United States despite the great job that the SPP did. It was supposed to be the pilot to end all pilots. Well, this didn't quite come true. Everybody wants to do their own. Nobody likes California or wants to be seen like being Californian.

Baltimore Gas and Electric, they just had a pilot approved by the Maryland Public Service Commission. Hawaiian Electric Company is about to embark on a pilot of their own. These are two new developments. Hydro Ottawa has a pilot that already has been implemented and perhaps Chris King might want to comment on that. They have 375 participants on three different rate structures, time of use, CPP and peak-time rebate.

Peak time rebate of course is something that is familiar to most of you. For those who might not know what it is it's basically -- it leaves your rate unchanged. So if your existing

rate was cents per kilowatt hour that's what it would be. But should you choose to cut your usage during the critical periods, which could be called day-ahead or day-of basis, then if you cut your usage by one kilowatt hour you will get a rebate equal to a previously specified amount, which would be 20 cents, 40 cents or 50 cents per kilowatt hour.

Some have argued that the peak time rebate and the CPP program would have equivalent impacts in terms of demand response and to a large extent that remains a hypothetical question. But this pilot is the first one I believe that will have an empirical side-by-side comparison of those two and perhaps it will help settle that debate. I believe the results are expected in mid-May.

Pepco has a pilot that will be starting soon and I believe it will also have a peak time rebate, a CPP rate and a real-time price. So these two new pilots will shed a lot of new interesting perspectives beyond what was learned from in the CPP -- in the SPP, excuse me.

Just a quick summary of the peak time rebate. Basically it uses the carrot approach as opposed to a carrot and stick approach. The

sticks got out and all that remains is the carrot in this concept.

All customers are enrolled in peak time rebate. In many ways it is like the energy 20/20 program. If you are a customer of XYZ utility you are automatically enrolled. And should you cut usage on the critical days in this case, as opposed to any day in the energy 20/20, the rebate will be given to you based on a kilowatt hour reduction that is computed relative to a baseline. So that's a new measurement that has to be done specifically for the peak-time rebate. It is not required for the CPP rates.

So the questions that arise about this new, innovative rate design are, will it provide the same amount of DR as the CPP rate? That requires new experimental evidence which should be forthcoming shortly. Secondly, how does one establish transparent baselines for millions of customers. California has 10 million customers so 10 million baselines would be needed.

Whenever I have talked about this particular rate design to utilities outside of the state some just freak out, some think it's the greatest idea and why did it take so long to get

developed, and one actually two days when I was in Hawaii, one said well how about a variable peak-time rebate. So I thought okay, what is that. So then it turns out it is the first cousin of the variable peak pricing rate.

So there is CPP with fixed prices, there is VPP with variable prices. So why not apply the same idea to a peak time rebate. So instead of fixing the rebate at let's say 60 cents per kilowatt hour, make it a variable and have it depend on the market conditions. As you can see you can create as many of these as you want within an hour, more than you can implement, but each of these is a flexible concept, okay.

So those are two issues about the peak time rebate. The third one is, as we have discussed this morning, the question of fairness and the question of class subsidies within the class. Customers who are peakier than average are being subsidized by customers who are flatter than average. I believe there are several numbers out there, 30 percent subsiding 70 percent. You know, it depends on which way you count the numbers.

The question is one of the dynamic pricing rates, like a critical peak pricing rate,

is going to eliminate that subsidy because the price will be higher. But in this case it won't unless the customer does some shifting. If they decide to stick with the existing rate then they're kind of just where they were before.

So it does have, you know, some nuances that need to be fleshed out in a full and fair comparison with the CPP. Yes, the stick is gone. But part of the stick was accurate pricing so some of that is gone too.

PTR is gaining popularity. It was, of course, piloted in Anaheim. It is, I believe, part of San Diego's application. I believe Linda mentioned earlier today that Edison is giving it serious consideration. It has certainly been tested in the two pilots that I mentioned earlier, Hydro Ottawa and Pepco. It may well become the most popular form of dynamic pricing if things continue at this rate.

Time of use rates of course also vary with time but they do not reflect the high prices associated with individual critical events and are not dynamic. That's sort of their weakness and it is also their strength. The rates can vary by season. You can have higher prices during the

summer as we do with our large customer time of use rates. The rates can vary by time of day, peak rate, off-peak rate, shoulder rate in some cases. They are commonplace throughout the United States for residential customers.

And as I said, some of those rates are so poorly designed that they have one or two customers on them. And that is not just because of bad marketing, it is because they are bad rates. They have 14 hour peak periods. What is a residential customer going to do if 14 out of 24 hours are the expensive hours? Well, they will exercise their option to not go on that rate and that's what they do.

So they are out there. Generally 2 to 1 to 3 to 1 is the peak to off-peak price ratio. And I believe in the Pepco area it is a 9 to 1 price ratio. I believe that rate has been phased out. They actually have a customer who used to get power on that rate. Maybe you can comment on that later on.

They will require some kind of a meter to time of use metering. It doesn't have to be an advanced metering kind of a meter but it has to be a different meter than the standard meter.

In Arizona we find two utilities around Phoenix, Salt River Project and Arizona Public Service, that actually have a third of their customers on time of use rates. Now Phoenix in the summer is really a place to be. The temperature rarely comes below 100 degrees. Last year it hit 118.

Why would a customer inflict this on themselves would be what a lot of people would ask. Well these people voluntarily have gone on those rates because they have found a way to benefit from those rates. The programs are well designed and well marketed.

The customers in Phoenix have an average coincident peak demand load of 7 kW. The corresponding number for California in the pilot was 1.22 kW. So the 7 kW customers, some of them have two air conditioners. Well they're still able to benefit from this rate. And they have shown without enabling technologies that they are able to do a lot. And I think that's where a lot of lessons learned can come from. These are not dynamic, they are not dispatchable, But even then people have, you know, coped very well with them.

In fact, Salt River Project told me that

they were trying to offer critical peak pricing now to their customers who are on the time of use rates and they were finding that those customers said no, we are very happy with the time of use rate, we don't want to change. So they might have, you know, a condition where they will have to market it to the other two-thirds of the customers who haven't tried anything. Because once people like a rate they'll latch on to it and usually it's hard to get them to change, even if they are on a time of use rate.

In Australia utilities are offering seasonal tariffs, time of day rates are being rolled out. And perhaps in the Q&A period we can get a comment on two on what else is going on with critical peak pricing in Australia.

Ontario, I mentioned earlier that the province has decided to roll out the smart meters. At some point they also decided to roll out these time of use rates. When the meters fall into place it will become the default tariff. My understanding is it will have a 3 to 1 ratio of peak to off-peak. They will have three pricing periods, the shoulder period will be a 2 to 1 ratio. So a pretty aggressive time of use rate.

They are seriously looking, as you see from the pilots, at doing dynamic pricing. So a lot of interesting things are happening out there. Some similar to California, some certainly way ahead of what we are doing here.

Then of course we have these incentive-based programs that are being offered both domestically and abroad. They differ though in how they are packaged. Some are voluntary, other are mandatory. Some require an active bid from the customer whereas others require the utility to call a time and say, now we are in that window so if you cut load you will be rewarded.

Some are utility controlled, others are participant controlled. some are price triggered and others are reliability triggered. Some are market based payments whereas others are fixed price payments. And that is where the variable versus fixed comes in.

Some have load curtailment in the sense of actual load curtailment, so banks of elevators, half of them are shut down in high-rise buildings or lighting is put at half intensity. That is an actually curtailment, loss of service involved.

Others have on-site generation. So no

loss of service, just switch from buying from the grid to buying it from your generators. Interestingly at a conference in San Diego a couple of months back we heard from a Georgia Power rates person who talked about the fact that their real-time pricing program, most of their customers who were the high responders were using on-site generation.

So they were not experiencing any loss of service, they were just switching on to the on-site generators. And the new constraint they were running into was an environmental one because of the carbon and other emissions that would be involved. So it's creating a challenge. But everybody, you know, is dealing with the challenges as they come along.

The last distinguishing feature is the response time. How much of a lead time do you give to the customers? Is it just ten minutes or is it two hours or is it, you know, a day ahead?

So that's a quick survey of what is going on. By no means is it encyclopedic. I am sure I have left out some of your favorite programs. If I have do let us know because the working paper is still a draft. I think we are

taking comments until the 27th of April, which is Friday of next week.

Let me now turn to the barriers issues because the barriers are ultimately where things have to change. I think that was, I believe generally the consensus position in the morning.

There are various implementation restrictions. For example, we are told in New York, time of use rates cannot be mandatory. In PJM -- And PJM for those of you who might not be familiar, ranges from Chicago down to Virginia. So it sweeps across the northeastern US. It covers 12 states and has 51 million population. It's very large. It's like, you know, one-sixth of the country.

Well the challenge there is they have low fixed tariffs that make wholesale prices and dynamic rates unattractive. It is kind of the unusual conundrum, the retail and wholesale are not connected properly. The retail rates are fixed by the state commissions, the meters are not out there and the wholesale prices are volatile.

And that's why PJM is now leading the country in doing these assessments on the value of demand response. They are hoping to make a dent

into the retail firewall that is out there on prices and they're hoping that the commissions will see the value and start changing the tariffs to finally offer that demand response.

Now they do currently have what they call automated load management or ALM, which is basically the emergency programs. The reliability programs like direct load control and interruptible curtailable rates. They account for one percent of their peak demand and they want to go beyond that one percent. That's what is keeping them there is the inability to change the tariffs.

Financial disincentives. This is primarily for the utilities. California, of course, has successfully resolved many of these issues. In other areas the compensation for the utility is based on sales volume. Anything that cuts the sales volume runs into, why should we do it we are losing money, the share price will come down kind of an issue. It sounds really old, right? But it is still around in a good chunk of the country.

The disincentives also prevent the utilities from recovering the lost sales due to

load managing. So it is not just energy efficiency. And ultimately lack of customer awareness. This seems to come up as the universal barrier that is out there. How do we educate customers? How to show them as getting some value out of these programs?

So that's sort of the survey. So where do we go forward as we look at opportunities here in California? What are the pathways to the future? At one point I was going to title this, Finding our Way out of the Labyrinth but I thought that might be a bit too negative so it's Pathways to the Future. Okay.

At least based on the interviews we conducted with the stakeholders and the discussions we have had since among our team we think there are four major categories or dimensions where re-thinking is needed. The first one is regulatory policies. The second one is analysis, analytical approaches, new approaches. Third, program design and marketing. Fourth, technology. And I have a few words on each of those.

the regulatory policy arena, I think one issue that certainly is apparent from the fact

that we are at 44 percent of the goal, perhaps reevaluate the realism of the existing goals. Look at current achievements, look at the market potential and look at the metering and how it is penetrating and all of those factors and perhaps re-think the goals.

Number two, AB 1X. Can something be done about it? If nothing can be done about it, if we have to live with it, then what else can be done to essentially make it irrelevant from a rate design perspective?

Third is address the issue of intra-class rate subsidies, which are if nothing else diluting the differential between the critical peak prices and the average prices and therefore making it more difficult to make the new critical peak pricings an interesting value proposition for customers.

And last is reassess the cost basis of the existing default prices. Subsidies in the default rates for customers under 200 kW may need to be phased out. Currently the higher cost of serving peak load is borne by all customers as a basic rate component. Customers with higher than average peak demand are being subsidized by

customers with lower than average peak demand.

Unless these subsidies are phased out many of the state's ten million residential and other customers will find it unattractive to participate in the price-based demand response program. This well is one of those huge barriers that needs to be overcome.

To illustrate the magnitude of the subsidies, and simply to illustrate it as opposed to quantify it definitely, I ran in the white paper, you'll see the details in a sidebar. We assumed that there were only three types of customers, flat -- flatter than average is probably a more accurate description. The average customer and a peakier than average customer. Those three types.

And we took consumption per customer and allocated it into those three different categories. And then we have the weighted average rates. The flat rate is ten cents in this example for all three kinds of customers. And if it was cost-based the rate would be 8 on average for the flatter than average customer, 10 for the average customer and 12 for the peakier than average customer.

So if you run that through and you do these computations, assuming a certain level of usage, then you can see that the cost number that's shown down below, under the flat rates every customer would pay $50. Under the time of use rate the flatter than average customer would pay $40 and the peakier than average would pay $60. So if you compute the subsidies over a period of years you can see it will easily run into the billions of dollars in this admittedly simple example.

I think the purpose here is just to make the point that these differentials are present in existing rates. Because for the most part residential customers in the state are not on a time of use rate, very, very few are. And so this subsidy is a huge problem that is there. It is hidden from view, nobody talks about it, but it's there.

It is not the only subsidy that is out there. The second major subsidy is the AB 1X subsidy. And to illustrate the magnitude of that subsidy, the pre-crisis rate, it was a two tier rate in California, it's shown as the black line, the solid black line. And let's assume for a

moment that that rate was cost-based and so it reflected the higher cost of serving customers about, let's say, the 300 kilowatt hour threshold.

Let's look at the blue line. The blue line, which is the dash line, shows what would occur if there had been a proportional increase in cost. As rates went up you would get that blue line. We instead because of the AB 1X restriction we got the red line. The first one, 30 percent, was protected and the rest of it rippled through to the other outer tiers.

And what does this do? Well what it does is shown on the next slide. You have to make some assumptions about customers, low user versus typical user versus high user, how the consumption is spread out. And since the rates kept on changing in the several years since the crisis you will use the minimum or you use the maximum or the average. If you use the average the numbers in the middle column apply. And if you go down the projected number across the low users, high users, you are looking at a subsidy of $17.3 billion.

Those subsidies have been already, they are already out there. It's not that this is anything hew. Those subsidies have been allowed,

they are mandatory subsidies. There is no opt-out. If you are in these boxes you're stuck. so the objection to rates being mandatory doesn't seem to apply to these because these are mandatory, you don't get to choose.

So keep those numbers in mind. I am not saying that necessarily those are the most accurate numbers, they are suggestive numbers. The real analysis would take a very long time to do. But the fact is that the state rate-making process for various reasons has already allowed these subsidies to occur and all we are talking about is taking another look at the subsidies, and in particular from a demand response perspective, seeing what they are doing to the opportunities. How they are making it more difficult for customers to find demand response attractive.

So here is an approach that is being discussed. For example, in the recent winter meeting there was some discussion of this approach and I thought I would share it here with you. The big issue is, what is the credit that customers should get for avoiding the hedging cost premium that is implicit in their existing hedge rates?

So if they are willing to go over to a

rate that is a dynamic pricing rate there is no reason for the utility to insure them against the volatility of prices. So think of it as a case where it is a fully unhedged rate being offered to customers, like a real-time pricing rate. What would be the benefit of that rate?

Well I didn't do it for RTP, instead I did it for CPP using a simplified example. With RTP as a default rate it appears to be highly unlikely so I thought well, for discussion purposes let me focus on a more realistic intermediate option, which is CPP.

So in a moment I'll show you a slide which will estimate the cost of the hedging premium as being three percent. We'll come to that in a moment.

So if you were to take that three percent credit and give that to customers who are on the CPP rate we will see that the rate will now become attractive to 70 percent of the population as opposed to just 50 percent. You will get the 50 percent if the rate was left near neutral, you'll get 70 percent if you allow for this three percent hedging. And then if on top of that they exhibit demand response, we expect several will

and some may not, then all together the rates will now become attractive to more than 95 percent of the population.

I think Commissioner Rosenfeld made a point earlier about we have to sweeten the deal. We have to get customers interested or nothing is going to happen. And so this credit can be thought of as a mechanism for sweetening the deal. And it is not an arbitrary credit, it is cost-based on the realities of risk management and option value.

The next slide shows how the credit was devised, or at least presents a graph that shows what the distribution looked like. So here is what I did. This is discussed in detail in the white paper. The amount of the premium using standard, financial engineering formulas depends on three factors. The first factor is the volatility in wholesale prices. The second factor is the volatility in load. The third factor is the correlation between load and prices.

So if you have a very volatile market and the utility is buying power in a volatile market clearly there is more hedging involved than if the market is not volatile to begin with,

that's the first factor.

The second factor is, is the load very volatile. When the load is very predictable then the utility has an easier job of hedging that sale than if the load is very volatile.

And the last thing is, if the load is volatile at the same time that prices are volatile what usually occurs for rather sensitive load, which is a lot of load. Then you get a big number.

So what we did in the simulation was we allowed each of those three Stochastic variables to vary randomly within reasonable ranges based on data from other markets where such data are readily available. While utility data are hard to find in the current California market it is certainly available in other markets.

So we took those data, ran the Monte Carlo simulation I believe 1,000 times and we came up with a mean value of the second premium as being 11 percent. the median was eight percent, the mode was five percent. All numbers were above three percent so I chose the lowest possible number than any of these three at three percent. And that's how I got the three percent number in

the example.

And if you go to the next slide, slide 28, you'll see what it does. so let's begin with the line at the top, which is the line that passes through the 50th percentile point. That's a revenue neutral rate. Half the customers are better off, half are worse off. Actually it's not customers, it is half the load to be precise. So half the load which is flatter than average is immediately rewarded by this rate and that is shown in the left side of the quadrant. Their bills go down as much as 13 percent for the flattest load.

And then on the other end of the spectrum they go up. And they go up beyond 20 percent. We kind of truncated it because the last two percentiles were really getting a bit far, but you would expect. So the problem with that rate option is that 50 percent of the load is going to be made worse off. And the 50 percent that is being made better off will not be sure which side of the line it is. So nervousness and fear will spread and a lot of the customers will just never even think of going there because the risk is too high.

What the hedging credit does is it said okay, we are going to provide a three percent hedging credit to these customers who have chosen the dynamic rate. And that shifts the break-even point from the 50th percentile point to the right to the 70th percentile point. So now you have attracted another 20 percent of the market.

And then finally when you allow for demand response, I believe we used a number of 10 percent, which was based on the various studies out there. That means that the break-even point goes to the 97th percentile. And now you have only three percent of the customers being made worse off as a result of this.

So this was made, these calculations were made with 200 customers, actual load data in the Baltimore area. The results would obviously differ from utility to utility but these are the kinds of opportunity that are out there once we think of more creative ways of designing rates and giving, for example, a hedging cost credit premium.

Some people say, well what do we do if we don't have a market? There is no hedging issue involved. Well then I believe another issue was

one that a commissioner mentioned. To the extent that these programs have reliability benefits, to the extent that they have capacity value over and beyond the CT avoidance they are actually helping avoid a blackout. They can take on a character that is similar to that of a direct load control program, the day-of kinds of programs.

So there should be an additional incentive paid to customers beyond just a price. Maybe it could be so many dollars per month as justification analogous to the incentive payment that is made to customers with a direct load control program. So there are ways to equalize these rates to the reliability-based program that will sweeten the deal and make it more attractive for larger groups of customers.

Okay. So those were the regulatory policy issues, I am now turning to the analytical issues involved. Some of these I touched upon earlier in the morning and I don't think we will go into great details on them.

But just for completeness there is the issue of what are the cost benefit tests, how do we deal with lost quality of service, and how do we factor in the call option nature of DR

programs. There are measurement and evaluation protocol issues and there is the issue of in particular establishing baselines.

The work that was done for working group two indicated that the answers would be quite different if somebody took the three day historical analogy approach or the ten day historical analogy approach. So there are still some issues to be worked out as to what is the best way of doing the baseline computations for those kinds of programs.

Okay, moving on. The next big frontier is better program design and marketing. I think some of the panelists indicated this morning the SPP participants really like the dynamic pricing rates. Most elected to stay on the rates, even when the pilot ended.

However, as I think one of the panelists indicated, a lot of time and effort and money was spent in educating those customers. It may be difficult to replicate that on a statewide basis but perhaps other means could be found.

For example those customers were in a pilot. There was no word of mouth happening, there was no community awareness because they were

isolated, and by design they were kept that way. But some of that might change in a full-scale deployment. So those were some of the issues that came up.

And then of course if you read the newspapers where discussion takes place on critical peak pricing or dynamic pricing or advanced metering you run into all of these issues. I will just paraphrase some of those comments, almost verbatim but not quite. Here is what their reactions are: "Oh my God, you are raising my rates by 500 percent." I don't know why but some of that seems to come up and roll off the tip of the tongue the first time you mention a CPP rate.

Second, "What will happen to my ailing Dad when I turn off the air conditioner?" Third, "I will have to unplug my refrigerator!" Four, "This is just another scheme to charge me more, since costs don't vary by time period." Last, "We have plenty of supply, there is no reason to push us back to the Dark Ages."

So obviously in spite of all the education that has been done and is being done there are still the skeptics and they probably

outnumber the believers nine to one. So it's certainly a challenge.

There are several ways in which to redesign programs to address customer fears. Some of them are listed here. One obvious idea is to use a two-part rate design. that has been the success behind Georgia Power's real time pricing program, it's a two-part rate. And I worked with them for several years. I also worked with other companies that had one-part rates.

And I noticed the ones that had one-part rates tended to attract usually a tenth or a twentieth of the number of customers that Georgia Power did. And the divergence grew over time. And so just through cross-section with the analysis it's clear to me that customers are unwilling to be exposed to 100 percent risk. Doing the two-part design really dampens it and still gives you the demand response benefits.

So that's one idea that actually could be adapted to critical peak pricing. It would require, however, the establishment of baselines. But to the extent that people are looking at peak time rebates they have already crossed that bridge. So the bridge could be crossed, you know,

in another direction if one wanted to.

Second, to tilt the rate computation so the dynamic pricing rate would make more than half of the customers better off. Now you could do that for a variety of reasons, one of which I mentioned which is the last bullet, the hedging credit. But you could do it simply as a market stimulant you know, to prime the pump. To get some excitement going.

Third, provide a one-time possibly recurring cash incentive for customers who join the program. Just about every other program out there, look at all the energy efficiency programs, they have all kinds of dollars hanging out there. And that's why customers come, you know, looking for those dollars.

You probably remember the expression that John Rowe coined. Of course he coined it for utilities but I believe it applies equally to customers. I won't repeat the statement because somebody is always angry for me for making it but you know what I mean. So there is always that cash incentive value. Okay, I know some people want to know so I'll say it: The rat must smell the cheese. That was his statement. John Rowe is

not the CEO of Excelon.

You can also provide a limited term bill protection guarantee to customers. So for the first year your bill will be no different. You will get a shadow bill and you will get an actual bill. And whichever is the lower is what you will actually be required to pay. that's the bill protection theory.

And then the last one is the hedging cost credit. I must admit that is the only place I have seen it being used currently is in Illinois, the real time pricing experiment that we talked about earlier in Chicago at a ten percent amount. The number I suggested was three percent.

I have heard Bernie Neenan and Chuck Goldman at the recent DR meetings talk about the implicit hedging premium in a restructured markets for the large customers looking at the contracts as being as high as 30 percent. That is based on the deals actually being offered to customers, 30 percent. And customers are taking them just to be insulated from not riding, wanting to ride the roller coaster.

So there are all kinds of opportunities and I have listed only five ways that occurred to

me based on the discussions and the interviews and the last three years of conferences as being ways to make DR more attractive and interesting.

So those were three of the pathways to the future. The fourth one is technology. And that was mentioned a lot as being an issue. But the sense I got was that it was more of a perception problem than an actual problem.

The technology is there, it has been tested. The smart thermostats for example. The auto-DR that is being tested for the larger customers, self-generation. A lot of technology options are already there. The challenge is awareness and adoption and costs.

I know we have a panel that is going to go more deeply into those issues so I have decided to skip that particular one. And that brings me to the close of this presentation.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Ahmad. A lot more interesting information.

Questions from the dais? Comments?

David looks like he is dying to say something.

DR. HUNGERFORD: While he is answering questions they are going to reset the projector so

that we can use it for the presentations.

PRESIDING MEMBER PFANNENSTIEL: A nice idea. Are there questions now of Ahmad?

MR. ST. MARIE: Actually there are.

PRESIDING MEMBER PFANNENSTIEL: Yes.

MR. ST. MARIE: Ahmad, what about on page 17 the load curtailment versus on-site generation. Do you see that as a successful load curtailment program? To me that sounds like a really bad program if the people are firing up their diesels in order to avoid utility rates. That there must be something really bad about those utility rates if they are firing up local generation.

DR. FARUQUI: So the question is -- Can you hear me?

MR. ST. MARIE: Yes.

DR. FARUQUI: Okay. So the question, why are they doing it? Or is there some other lower cost --

MR. ST. MARIE: Can you comment about that program in any more than just what you said when you were at the dais.

DR. FARUQUI: Well I guess all I would say is that I looked at data not only in Georgia

Power service area but also in Tennessee Valley Authority. I looked at data in New England. That seems to be for large customers their first line of defense. When the price begins to hit $1 a kilowatt hour, either directly as a real time price or as a curtailment opportunity, that's what they do. They have in a sense this equipment lying idle and they have now discovered another use for it, which is to lower their utility bill.

MR. ST. MARIE: Okay, and they can generate for less than the cost of buying the power from the utility.

DR. FARUQUI: Exactly, it's their lower cost. So in their loading order backup generation has been brought in as the first line of defense.

MR. ST. MARIE: Okay. I actually had another question and this is a conceptual question from page six of your presentation, which shows a, it looks like a production possibilities frontier where there's supplier risk and consumer risk.

You have that graph bowed out in such a way that it looks like time of use pricing is probably the worst of all worlds because the total risk from the supplier's point of view and the consumer's point of view is a high sum compared to

either of the rates at the edge, the flat rate or the RTP. Is there a reason why that is bowed out like that?

DR. FARUQUI: Actually that was not intended. This is more like a ranking as opposed to -- It's an ordinate scale rather than a cardinal scale. So if you were to add them up I think the best way to look at it would be the third missing axis, which I mentioned, the average rate. And we are working on an example where we would add that in. I think that would make it a little bit easier.

The highest rate that the customer is going to have is in the flat rate and the lowest average rate is going to be with the RTP. But it will also have the highest standard deviation. So then depending on the customer's own, you know, tradeoff between risk and expected value, some will pick time of use because it has less risk for them even though it has the higher average rate. But they don't want to go to RTP because that will have a lower rate on average but it will have the highest variance.

so depending on the individual customers they will take one or the other of these. And the

only point I was making was that by giving them choices you don't force fit them all into the same single bullet. So right now in the market we might just have the flat rate for residential customers. They are all being forced into that particular dot as opposed to being allowed to maximize their own individual utility. That's sort of the point I was trying to make.

ASSOCIATE MEMBER ROSENFELD: I think next time you draw that graph, Ahmad, I would just make it a straight line.

MR. ST. MARIE: A straight line, or even bowed in.

ASSOCIATE MEMBER ROSENFELD: Then you won't ask him embarrassing questions, right?

(Laughter).

PRESIDING MEMBER PFANNENSTIEL: Other questions? Should we move on to the panel then?

DR. HUNGERFORD: I think so.

PRESIDING MEMBER PFANNENSTIEL: Did you have a special order in mind, David?

DR. HUNGERFORD: Well, we're going to do it with the order that's here on the agenda except that we are going to insert Mike Oldak at the beginning.

MR. OLDAK: Thank you, thank you for this opportunity to address the CEC and the California Public Utilities Commission.

I'd like to sort of, I guess first of all I remember one of my business school professors came up with one of the mottos that I live by. That is that life may be a series of least lousy alternatives and sometimes I think he was an optimist.

But I think what we are looking at right now is a point in time where the need for rate design is urgent. And not necessarily based on today's numbers but on what I see and what is coming down the pipe for the electric utility industry and ultimately for consumers.

We see that the US demand is increasing across the country. People are buying bigger homes, people are getting more electronics, computers, flat screen TVs that use five times the amount of energy as old ones. We are using a lot more electricity and hopefully we're using it more wisely.

But at the same time we see reserve margins shrinking across the country. And when I take a look at what I see in terms of, thank you,

in terms of infrastructure investment for the industry, right now the regulated sector in the industry has about $400 billion invested. Over the next ten years I am looking at on the regulated side about $50 billion for generation, about $85 billion for transmission, 145 for distribution.

We have seen inputs to the industry. Natural gas prices going up 300 percent. We are seeing pension benefit funds and all these other costs increasing. This industry is no longer a declining costs industry.

And we are seeing environmental costs right now go over the next ten years 30 to 60 billion dollars. But that can be substantially more if Congress addresses the global climate change issues. We are seeing Congress right now seriously considering legislation. They may not pass it this year but next year I think they may have something.

The Supreme Court has just ruled that carbon dioxide is a pollutant and that under the Clean Air Act that EPA should regulate it. We are seeing states, California again taking the lead, thank you, on doing something itself.

And we are moving more toward renewables. Did I miss one? I'm sorry. When we talk about, excuse me, climate change we are looking at technologies that are not here yet. When we look at clean coal technologies we are not expecting these technologies to be commercially available until 2015.

When we talk about carbon capture and sequestration we are talking about commercially available between 2020 and 2025. When we talk about the nuclear option, which is getting expensive, these plants are not expected to come on until 2015 or 2020. So even if we were to build these cleaner generators these options are a little bit down the road.

We are looking at renewable resources and Wind is the fastest growing and we're relying on it. It is cleaner and we are relying on it to a greater extent. And we have got 22 states and the District of Columbia with renewable portfolio standards.

The concern I have here is that as renewables are becoming a bigger part of our mix, and they are generally free of CO2 emissions, I keep seeing almost weekly or monthly states

passing new renewable portfolio standards. Twenty percent by 2020 has become the norm or 25 by 2025. The question is, will this country have enough renewables to meet all those standards as we all move toward the renewable requirements?

Will we be able to take energy efficiency and demand response programs into these renewable portfolio standards? And at what cost will it be once we run short and everybody is vying for renewables or credits? We are looking right now I think to get customers involved in demand response. I think that's why we are here looking at AMI and critical peak pricing.

This is a study that was done by Eric Hirst many years ago and really it's my only animated slide. It basically shows with a three percent reduction in demand we can move market prices substantially down. And you can see here just with the three percent reduction we can move market prices substantially down. And you can see here just with a three percent reduction in demand we have gone in this hypothetical example almost cut the wholesale market price in half.

A lot of people have looked at three percent as sort of a guideline on what it's going

to take to tame these wholesale markets during these critical peaks.

It's time to put the lessons of the California pricing experiment into practice. And let me tell you, coming from a state that is looking at all these things, I live in Maryland, I can't throw stones at anyone anymore. But I do understand some of the problems where rate design does not keep up. Rates and rate design does not keep up with costs. And that's why I think it's imperative that costs -- prices reflect costs and rate designs really reflect the time of use and the critical periods.

Critical peak pricing as we have seen with the experiments in California can provide the ability to reduce the peaks, to moderate the volatility, to provide customers -- and I think this is important.

I think customers want to be part of the solution. They don't want just to see rates and see like a bill at the end of the month, they want to be able to do something to be able to control their energy usage. And I think by giving them critical peak pricing, smart meters, smart thermostats, smart appliances, that we're moving

away and in the direction of giving that ability to help control their own bills and their future.

I think what we see from some of the experiments with, you know, AMI and smart meters we can have 27 percent reductions in peak. This is astronomical. If we are looking at what we can do with a three percent change in these peaks during those critical peaks, 27 percent is amazing.

I think the thing is, though, that we found in this experiment that customers do respond to proper price signals. Unfortunately, customers respond to improper price signals also. And if we are going to ignore the proper price signals they will also.

When we look at the PJM study, which is sort of an estimate of what it would mean in terms of PJM we looked at a three percent curtailment. This is another piece that Ottawa was involved in. We some five to eight percent reductions on average during the critical peaks. We've seen, you know, hundreds of millions of dollars in savings. We have seen benefits, the consumers have seen significant benefits. Even those that did not participate, the non-participants saw the

benefits of having those peak periods reduced.

We have seen some other potential benefits of the study. We have seen enhanced competitiveness in these markets where we are not relying on a few peakers on those markets that are competing against each other at very high prices. We have seen reduced price volatility. And what we heard from consumer groups is that the three things they want most, stable rates, stable rates, stable rates. And they're willing to pay more for the stable rates and frankly I think to a certain extent we should give them that option.

I think what we do when we move toward smart meters and smart appliances and smart thermostats is whether there is a provision against the extremes that we have seen.

And my concern is that we are getting back into that period where we are going to see very expensive generation and very expensive alternatives. I have seen the ITCC plants that were estimated to be $1.2 billion now coming in at over $2 billion.

When we look globally to India and China, China is building a power plant a week. When you look at copper prices, steel, all the

components that we need here in the United States to build our infrastructure, those prices are going up by multiples. You just go down to Home Depot and try to get a coil of wire that used to be, you know, 25 feet for $10, it is now $35 for the same amount of regular wire for your home.

We have the ability to use AMI, not only for reducing peak but I think for benefits for the utilities to operate their systems more efficiently. With this they can help reduce congestion. With proper pricing and control they can help avoid T&D upgrades. And I think they can really operate the system more efficiently.

So there are benefits even to an extent that there is a hurricane or some disaster, having the ability to control these loads in times of emergencies can provide some real benefits.

But what do customers need? And I know I'm going to get a lot of flack with EEI coming in and telling you what customers really need but I am going to try anyway. They really need a balance and I think that's the important thing. I think that's what Commissions are there to do is provide a balance of resources that provide reliable service at reasonable rates.

And let me tell you, there's lots of options and there are lots of great public policies. There are a lot of great options out there. But at the end of the day the customers pick up the tab. And I don't care, you know, what kind of technology it is, really at the end of the day the customers pick it up.

When you talk about Ahmad's picture on the different types of rate design and does the supplier pick up the risk or the customer pick up the risk? Let me tell you, at the end of the day if the supplier is picking up the risk he is passing that through in rates. So at the end of the say customers are going to pick up the tab.

And if we are already looking at gas prices going up 300, 400 percent, we're already looking at new generation options being so much more expensive than existing options, when we are already looking at all of these different components that are going to increase customers' rates it is time now to make sure that the policies we put in place give customers the ability to control their own destiny. I think that's why it's important to do it now.

Even if you are at a point in time where

you have got reserve margins that point in time is not going to last forever. And maybe this is the time to do it now. Because if you do it and there is a problem and you really need to put in a high price there are problems on the system. The worse case it is not going to be as bad as we have seen in the past when the California crisis, when supply and demand really did go out of whack. So it's a time to put these things in place and let customers get used to them.

Eighteen years ago I went on a time of use rate in Washington with Pepco. No, I did not want it. But I did get a shadow and unfortunately I didn't get a chance, the option to take the lower of the two. They left me on my average cost rate. My rate was a penny and a half, two and a half, 18 cents on-peak. And I stayed on that rate for about 18 years and I saved about ten percent a year. So I think Ahmad is right and Commissioner Rosenfeld who talked about 80 percent of the customers saving money. I don't do that much but I am still saving money because I am getting proper rate design.

I think we need options that pursue good public policies, not without the unintended

consequences leading to another energy crisis. And we need policies that moderate peak demands, moderate volatility, improve system reliability, and we still need policies that protect those who cannot protect themselves. Those are still things that I think consumer groups need.

There is no mystery here. Proper price signals are the first step toward consumer benefits. There is no mystery to that. Unfortunately bad rate design will ultimately hurt consumers. It may look good in the short term but in the long term they'll get hurt.

We had in Maryland our rates, our regulated rates in 1999 were reduced to 1992 rates and frozen for seven years. So we went from 1992 regulated rates up to 2006 costs. A 72 percent increase because they went back into the market three months after Katrina wiped out a third of our gas production. We can't have those kinds of things. You know, it sounded like a great deal when they negotiated it but later on it -- customers don't want to see that kind of rate shock and we don't want to put them through it. I think trying to provide a glide path for what I think are going to be increasing rates will save

consumers a lot of anguish and be better for them.

Customers are a little concerned with new rate designs. And let me tell you, Ahmad is right. I took a quick survey of my members, I represent the investor owned utilities on time of use. And that was the year I started at the Federal Power Commission back in '74 so I have been around for a long time and I was with DOE when they did time of use.

And the IOUs had literally hundreds of thousands of customers on time of use pilots. Now we literally have hundreds of customers if that in most of these because customers just didn't want them. But I think what we saw from the California experiment is that with time of use rates you saw a six percent reduction the first year. The second year it was 0.6.

These are things sort of like if I drive down the road now and I see gas at $2.75, I pull in and fill up my gas tank. You know, three years I wouldn't have gone to that gas station but customers get used to it. But I think that's why it's really important. I think EPRI coined the term properly, prices to devices. And we have seen in the California experiment when you have

these prices going down to consumers and to smart thermostats you get amazing results. And I think this is where we need to go.

But changes must come with education. Let me tell you, bringing customers on early now and getting them educated slowly, it is a long process. And it is time to do it now when you are not in crisis mode.

When AMI makes sense, and let me tell you, it doesn't make sense for all of my members. And we are around the country doing these same analyses that you are doing here in California and looking at the cost benefits.

In many cases they put in automatic meter reading and gotten a lot of the value out of the advanced technologies, in other places they haven't. It really depends on your customers, it really depends on your supply mix. But where it does make sense, as Commissioner Rick Morgan keeps saying, don't give me smart meters with dumb rates.

I think it's important to put critical peak pricing in as a default tariff and then give the customers the option. If they want an average cost rate I'd let them have it but make sure it's

a premium rate and it reflects the fact that they are paying an average cost rate when the system is hitting a peak and everybody else is paying through the nose. They need to understand that they are getting a deal. That it's an option that they can take advantage of but it's a premium option and not just something that they are entitled to.

I think this way -- And I think Commissioner Rosenfeld said 80 percent, Ahmad is looking at 90 percent-plus of customers who are benefitting from getting the right price signals and really removing the hedging cost that goes on to an average cost rate. If customers want it I'd let them pay for it. Thank you very much.

PRESIDING MEMBER PFANNENSTIEL: Thanks very much.

Questions? Yes, Commissioner Bohn.

CPUC COMMISSIONER BOHN: Is there any argument, and if so what is it, that some of these investment costs are better handled through a tax system than a rate system? One of the issues always is, who pays and we have been talking in a kind of closed system. You have ratepayers and all the costs that the ratepayers -- there are

other people around and other kinds of ways to generate capital to do some of these things.

What is the argument or is there an argument that some of these costs rather than being ratepayer-based should be handled through the agonizing experience of dealing with, frankly, tax increases?

MR. OLDAK: That's actually an issue that I'm working on back home in terms of depreciation rates for advanced metering. You know, should we move advanced meters from the old mechanical meters which had 20 year depreciation to a five year depreciation. And there's a lot of reasons.

But going right to what you are talking about, Commissioner, when you look at the utility's cost benefit analysis, and I'm talking about one of my members, if we are buying from the wholesale market and it's high, we pass those costs through. And, you know, basically, how do we take it, you know, put that into our analysis of whether or not we should be spending all this money advanced metering. And it's difficult.

So you are looking at advanced metering that can reduce the peak and lower the cost to

everyone. Even those who don't participate in the program are going to see the benefits of that. You know, how do we tilt that scale when, you know, my members are -- And that's why I brought it up. We're looking at making about a half-trillion dollars worth of investments over the next ten years in infrastructure, needed infrastructure in this country.

When my members are looking at going and building generators, transmission, distribution, all these other things and then trying to balance, you know, whether or not to make an AMI investment, how do we put our thumb on the scale and say, well if you make the AMI investment you're going to reduce the wholesale market prices and everybody, all society is going to benefit from that.

So I think you're right. There are ways of trying to provide other benefits than just directly from the ratepayers. That there are societal benefits from moving in this direction that really can be taken care of through the tax code and through other means.

PRESIDING MEMBER PFANNENSTIEL: Other questions?

Thanks, good information, appreciate it.

Moving to Chris King.

MR. CHRIS KING: Can I go up there? I don't trust Dave.

DR. HUNGERFORD: I had just gotten into a rhythm with everyone else.

(Laughter).

MR. CHRIS KING: Not really. Thanks for having me.

I'm going to repeat some of the things, hopefully not in a repetitive way, that you have heard from others today. I am representing Silicon Valley Leadership Group. SVLG is a group of 200 businesses headquartered in Silicon Valley with 200,000 employees, including some of the largest employers like IBM and Hewlett-Packard, and we have an energy committee, among other things.

In this whole area of demand response SVLG is pushing for customer-friendly demand response. And I would say that the focus is more on reliability than on savings. Energy costs actually tend to be a very small percentage in the cost of operations for most of our members but having a blackout is something that is just a

horrible thing that we all want to do whatever we can to prevent. So there is that emphasis.

SVLG is real big on environmental initiatives, sustainable Silicon Valley and so on, and DR fits right in there. And our whole approach to things is pragmatic consensus building, common sensical.

So one of the things we did was develop some demand response principles. One is that a program should be voluntary. We've heard a lot about options, we strongly support that. In fact our committee, although believing that everybody should participate in demand response, actually thinks that flat rates should be an option, fully hedged, and I'll get to that.

We are big believers in markets. That prices should be market and cost-driven, incentives should be market and cost-driven. If customers give businesses the price signals then we'll figure out the best way to reduce our demand to respond to those price signals.

Demand response should be able to compete with supply side resources. It is interesting that in the portfolio standards for around the country that came up earlier. At least

one state, Pennsylvania, includes demand response in the portfolio standard, which is kind of a shame that we didn't get that into more states.

We always look for balance. The utilities have needs, customers have needs. Another thing that is important is that all customer classes participate. that we don't expect businesses to cut all the demand to avoid the blackouts and not have other classes participate.

We have been strong supporters of the AMI programs and applaud the utilities on those, as well as all the things they are doing on demand response. In fact California is just a great example of so many things going on. I think we can justifiably congratulate ourselves on doing a lot of great things over the last five years.

So I am going to give about five different success examples. Things that work in the real work very effectively that have some important lessons associated with them.

The first of these is one of our members, Roche Pharmaceuticals. Before the energy crisis they didn't really care about energy costs, frankly. When you are manufacturing drugs it is

not a big part of your expense. It's certainly not -- it's a very tiny percentage of your overall costs. And then Roche got interested.

Now I don't know if you would call this result from demand response or from energy efficiency, what it really is is putting everything together, and you see both gas and electricity are involved there.

What happened back in 2000 is Roche signed up, actually it was 2001, Roche signed up for a demand response program where they got energy management systems to be able to control, monitor and control their operations. So they took those and said well we're not going to just use those the top 100 hours of the year, we're going to use those all the time.

And you see this dramatic reduction coming here from that program, which I believe the Energy Commission ran. What was designed to eliminate one percent of their peak demand actually reduced about 30, 35 percent.

The other lesson here is that over time the business has continued to grow but the energy usage has continued to go down. And that's because of the information. There are not two

killer applications. There are many, many things that are done. It's adjusted every year and increased every year.

So again, this gets back to the point of getting the information and the price signal to the customer plus the automation tool and letting them figure it out with their smart energy managers to work it out.

Automation came up earlier. One of the things we talk a lot about in our committee on demand response is promoting technology. And this is -- We saw this in California pricing in the Statewide Pricing Pilot. These are actually residential customers. And this shows the synergistic effects. Pricing alone around 20 percent, load control alone closer to 30 percent. Put them together, nationally the average is 46 percent reduction. We saw I think somewhere between 27 and 37 in California depending on which analysis and year you were looking at. So common sense, we strongly support technology and incentives for it.

Ahmad talked about Georgia Power. Why is Georgia Power so successful? It's because the baseline approach, which granted has some huge

problems, but it gives the customer what they need to feel comfortable with the program. Because basically it says, use your energy the way you would always use it, namely in your baseline which is this orange dotted line here, and you're going to pay the same bill as you always would.

Now if you want to respond to prices, if you want to use more during the low cost hours and use less during the high cost hours, you're going to save money. But you don't have to do that, stick with your baseline and you'll be fine. And the only changes you'll see are when you go away from your baseline. And the result of that has been that over 80 percent of these large customers participate, voluntarily opt in.

One of the questions that comes up, and I was in all the working groups in California on this issue, is well we don't have a wholesale market, we don't have hourly prices that we can input into this. Well they don't have it there either and what they have done is they have used their utility marginal costs, their system LAMDA.

And there are some wholesale trades that go on an they use that for this program. And they can predict the reductions actually very

accurately based on the price of the day ahead that they're given.

And you can see in this chart that this would be the load up here, these three lines, and the prices, these three lines down here. The higher the price the lower the load. And they have a very accurate forecasting model. One reason for that is because there are so many participants. If you are talking about five participants you're going to obviously have trouble doing this. But they've got 1600 customers so the diversity is an important component of that as well.

So we've heard a little bit about the Anaheim peak time rebate or critical peak rebate. Of course it's actually exactly the same concept as the Georgia Power real time pricing. The difference here is that the customers stay on their flat rate or tiered rate depending on what they are on and this only applies during the critical peak hours. The have a baseline that is calculated in any number of ways and then they earn a rebate based on using less than that.

Baseline is not an easy thing. There are a lot of ways to calculate it, they all have

problems. But the problems are no different than any of the problems that you get in calculating rates because you have to deal with averages for the entire system. So in that situation you're going to have winners and losers with any approach, any methodology you take to any of your rates. So why is this --

And actually we talked about this in our committee and our members are really interested in this. Obviously the idea of it being a no-lose proposition is attractive even though the dollars might be very small. But that no lose thing makes it so you can put customers on it automatically and it is very popular with customers. Anaheim was able to get 30 percent of the customers recruited with a single mailing, no phone calls and no incentive payment, unlike the Statewide Pricing Pilot.

We also heard about hedging costs. And this is one, well actually two analyses here. Up at the top the Chicago residential program. In 2005 anyway they estimated that the hedging cost was ten percent. So when they rolled out the program they told customers on average your price is going to be ten percent lower, you are going to

be facing these higher prices on these critical peak days. And it was very popular with customers.

And NEPOOL hired a consultant, Bernie Neenan whose name came up, and said, you know, we want you to look at different default pricing options. I guess you'd call it opt-out in our parlance, for the large commercial customers. Many states have gone with the real time, with the hourly pricing as the default pricing. And they said in Connecticut we're not quite ready for that.

So they looked at variable peak pricing. And as Ahmad explained, the off-peak price there is fixed throughout the year, the on-peak varies every day based on the actual wholesale price. Like the critical peak TOU and inverted tiers and estimated the hedging costs. So of course there is no hedging cost with real time pricing because you're only passing, you are simply passing through the wholesale costs. nd then you see higher levels going up to 15 percent for a flat, inverted tier price.

What they did next was they said, well over a period of years how much are these

customers going to save? How much of that is going to be from demand response and how much from the risk premium and you see the results here. Most of the savings results from avoiding paying for that hedge. There are significant savings but much less from the demand response itself.

And one analogy I like to draw here is with gasoline prices, which as we know are extremely volatile. And there is nothing in the market preventing companies from offering hedged gasoline prices to any of us. But none of us buy them, we'd rather take the market risk. And this is why, because we don't want to pay these hedging premiums.

I am going to conclude on information. This actually comes from the Hydro Ottawa pilot that we're working with one of the companies working on that. And this reflects SVLG members' desires for information. It's got to be simple.

They want to get information automatically, not have to go somewhere, log into a website and get it. There is a lot of talk about putting information on websites and that's a good thing but by far the number one interest is to get that information with the monthly bill.

There is a strong and general interest in both more frequent data and real time data to the extent that it can be available. And the facts of this are dramatic.

We have been talking about greenhouse gases. On the one hand we talk about demand response and cutting three percent of the peak and putting the wholesale price for $100 a year in half, which is all terrific stuff.

But if I can save two, three, four or potentially even ten percent of total consumption based on this kind of information -- This is a literature study of about 40 different projects. All sorts of different information feedback with an average result of ten percent.

Particularly in California we are not going to get ten percent because we are already so efficient on that. But information by itself and the value of a two or three percent savings in total energy usage is two or three times probably just the demand response savings.

I'll quickly point out the format here should be totally intuitive, I shouldn't have to explain it to any of you. Obviously the daily usage with the different prices in there. And

this was with residential customers that had no questions at all about understanding this. And they really liked that and we did get the customers calling and saying, well, you know, I was away that weekend and it turned out that the utility had to actually swap meters for two customers. But it's very intuitive and they learned a lot from this and liked it.

So those are some success stories and some things we would recommend looking at as the state goes forward. Thank you.

PRESIDING MEMBER PFANNENSTIEL: Chris, I want to make sure I am not being confused here.

The information graphics that you have shown here were ones for residential customers or for the Silicon Valley Leadership Group customers?

MR. CHRIS KING: This is the kind of information we would like to see.

PRESIDING MEMBER PFANNENSTIEL: All right.

MR. CHRIS KING: So this is an actual example from the residential program but the kind that we'd like to see.

PRESIDING MEMBER PFANNENSTIEL: But it is what your customers would like to see.

MR. CHRIS KING: Yes.

PRESIDING MEMBER PFANNENSTIEL: And then back to what kind of programs would your customers like to have? We heard a very high need for reliability. So you want, it's less price-driven and more reliability-driven I take it. Would that argue one way or the other for mandatory, opt-out programs or voluntary opt-in programs? What is the general sense of using these programs for your customers' business interests.

MR. CHRIS KING: In our principles we sent a, we would like to see all customers have a choice of three options, hourly prices, time of use prices with or without critical peak and flat prices. Recognizing that there would be hedging involved with the latter two.

As far as the mechanism I think we were unique in that we signed on to settlement agreements with both San Diego and PG&E/SoCal Edison on the critical peak pricing. In San Diego's case they convinced us that even though it was technically an opt-out --

Well, the terminology is problematic because what they proposed about critical peak was that they would not put anybody, any customer on a

critical peak price unless -- if they did not talk to the customer. The default was, put them on a critical peak. In that case I don't think there is any real default.

And then in the other utilities' case it was opt-in. So that kind of San Diego approach works where it's easy to make a choice, there is no penalty associated with making the choice and there is that ability to make contact with every business.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Other questions?

Thank you, thanks very much.

MR. CHRIS KING: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Chuck.

MR. CHARLES KING: Thank you. I am Chuck King, I am the vice president of market development and program management at the California ISO. The mic is not on?

Again, I'm Charles King, I am the vice president of market development and program management at the California ISO. I am responsible for the development of market design from the conceptual development right through to implementation.

And as I am sure many folks are aware, we are in the process of implementing new market design under MRTU which will have two settlement systems, day of market and locational pricing.

What I'd like to talk about today is our vision for the markets and how that vision incorporates demand response resources. This morning our board of governors approved a new five-year plan for the California ISO. And that plan articulates a vision for the markets and a vision for demand response.

In short, our vision for demand response is that these resources be able to complete directly, level playing field, with conventional generation resources in the, in the markets. Now we have initiatives in that business plan which will move us from where we are today towards, towards that vision.

And what I would like to point out is that we can't look at demand response all by itself, we have to also look at the whole market and the operation of the power system in total.

I see linkages here between the market design, the energy market design. What we're doing in resource adequacy and what we'd like to

accomplish here in demand response.

For instance in the energy market design we are going into our release one of MRTU with three local area pricing, three area prices for load. And FERC has already told us well that's all right to start but we'd like to see more granularity. I would argue that the level of granularity that we should move towards is the same level of granularity that we're working with in resource adequacy where we have defined local and zonal requirements.

That mapping, if we use that same mapping that we're using for resource adequacy to set up our local area prices, that will naturally encourage programs like demand response programs to participate on a level playing field with generation both in the RA space as well as the energy market. So that's something where I think we need to maybe step back and look at what we are doing in these various areas and make sure that we coordinate as develop the markets going forward.

What is foundational to that vision is -- Another area that I know is of interest to the Commission is the area of loss of load probability as a means of determining what the reliability

requirements are. And again, that is foundational to setting up that mapping that we build the resource adequacy program on and the energy market and finally things like demand response.

And what you'd like to be able to do is have these resources competing in a way that they can be not only planned on and accounted for in our planning processes but used right through to real time operation. In other words, Jim Detmars and his crew would like to be able to surgically deploy demand response. And again, if we have that mapping back to the localities and the zones that makes that very easy to do.

And I have seen that put in place, for example in New York, with the 11 pricing areas. Those same areas map to the localities in New York's ICAP market. And demand response resources participate in the ICAP market. They are called special case resources. And those resources are called first by the system operator. They have a standing bid in the operator's energy market. And if called upon those resources can actually set the price in the energy market, in the real time market. so all of this can dovetail together very nicely. And again it really requires coordination.

I think that another -- If we have a vision we also have to have a strategy of how to achieve that vision. And again I think we have provided comments in the resource adequacy proceeding and we plan to participate in the demand response proceedings as well to help define what I would refer to as the operating attributes of these, of these products.

If you look at the system operation what would be ideal from an operator's perspective is if I had something that looked exactly like a generator. Because that's the most, you know, something that is controllable, that would be dispatchable every five minutes, that I can use to manage congestion.

But when we look at demand response programs we realize that while demand resources don't exactly look like a generator from an operator's perspective, because we have notification times and we have minimum times that they're available, so part of our strategy for incorporating demand response into the markets is to do a thorough determination of what the attributes are that would make these resources useful to the system operator. And that is

something we want to tackle this year.

And then once we have defined that operating region we then think that we can take a look at the programs that exist today and see, all right, how much of those resources kind of fit into that operating region. And we'll find that a lot of them fit, you know, directly in.

We'll also, we may find that there are some programs that if we make modest changes to the programs or modest changes to our operating procedures we may be able to incorporate more resources directly into the system operation.

And then I think once we get to that point we then will look at what is left and have to decide, well there may be more extensive changes required. Does it make sense to pursue those or to develop new products going forward.

So that is our basic strategy and how we can ramp up the demand response participation in the market over the next five years with the vision of having it compete on par with conventional generating resources.

More details in our five-year business plan, which is posted on our website. Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank

you. Questions? John.

ASSOCIATE MEMBER GEESMAN: Do you have a sense of what subset of the existing demand response programs meet your criteria and actually do deliver operator quality resources?

MR. CHARLES KING: Well my understanding is that a majority, not all but a majority of the resources are tied to what we refer to as a stage two emergency. So we have to be in a stage two emergency before we can access those resources.

And from an operating perspective, although that is useful we actually believe a lot of the resources could be more useful if we could access them before.

ASSOCIATE MEMBER GEESMAN: It's kind of like the air bag in your car.

MR. CHARLES KING: So I think what we would like to see over time is not necessarily adding to the amount of resources that we have access to in a stage two emergency but actually generating -- if it's possible to move some of those resources up so that they can be accessed earlier. Or develop programs that encourage participation earlier and ultimately respond to price. So that we don't get, we'd prefer not to

get into an emergency situation if possible.

ASSOCIATE MEMBER ROSENFELD: I might mention a thought which just occurred to me. Obviously all the demand response doesn't look like a generator. You just said that.

MR. CHARLES KING: That's correct.

ASSOCIATE MEMBER ROSENFELD: I don't think it has ever occurred to us before but some demand response, mainly lighting, has instant response, whereas air conditioning of course doesn't. I mean, an air conditioner is cycled and whether or not we get demand response depends on the outside temperature and so on.

We might want to do an experiment in which you get some control over the lighting more directly than just going through economic response. I mean, I can see a program in which you could trim your demand with lighting almost instantly and with almost real time feedback.

MR. CHARLES KING: That actually brings up another point in that the level of granularity is important to the system operator. What I mean by that is that we may have --

Let's say in San Francisco we have 1,000 megawatts in a particular program. If it has to

be used all or nothing, that's difficult from an operations perspective. Whereas if I can use 50 megawatts or 100 megawatts at a time, then again it looks more like a generator and makes it much easier to operate the system.

And I think it would be -- Also when you look at some of the data that was presented previously, you know, again, you don't need much of a drop to have a significant impact on the wholesale price. So granularity is important to us as well, not just the total volume.

And having the kind of control capability that you're speaking of I think would take us in that direction of being able to just use what's needed.

ASSOCIATE MEMBER ROSENFELD: What is needed and where it is needed, yes.

MR. CHARLES KING: Exactly.

PRESIDING MEMBER PFANNENSTIEL: Yes, Commissioner.

CPUC COMMISSIONER CHONG: A quick question. You were talking about whether we could trigger some of these DR resources at stage one instead of stage two. What prevents us from doing it? Do we need to do a regulatory change to

programs or is it something that is part of procedures?

MR. CHARLES KING: I believe it's a regulatory change that is required. In other words, we are bound by our tariff to follow the rules that are embedded into the programs. And right now a majority of the programs tie the activation to a stage two emergency.

Where if that could be changed, you know, we have other points that could be used as trigger points like alert and warning states. Where in an alert state we may, or a warning state we may be forecasting that we are going to run out of resources and that could be a trigger point.

In an alert state we have already run out of resources but we are not in a stage one emergency. So these are earlier points in the trajectory there where demand response resources could be very useful.

For example, the AC cycling load, we don't see any technical reason why that couldn't be accessed earlier on. I'm aware of experiments that have been where in particular areas air conditioning was turned off for periods of an hour or two hours or three hours. And then people have

gone back and checked with the customers and say, well did you notice, and people were totally unaware that their air conditioning had been turned off for a couple of hours.

From my perspective as the system operator that couple of hours could be the peak time of the day. And if indeed you can cycle these things off and it has minimal, perhaps even it goes unnoticed by customers, that could be a very useful resource to have.

PRESIDING MEMBER PFANNENSTIEL: Thanks very much.

Barbara Barkovich.

DR. BARKOVICH: Thank you. I do have a brief presentation and I also wanted to respond to some of the things that Chuck King just said because I have some real concerns about changing the rules for some of the existing reliability-based programs and the implications for customers that I would like to bring to your attention. And I'll leave that to last.

Did I disappear? I only have a few overheads because I realized that it would be getting late in the day.

DR. HUNGERFORD: My apologies.

DR. BARKOVICH: It's okay. It's because I got it in to you too early.

DR. HUNGERFORD: The first one in.

PRESIDING MEMBER PFANNENSTIEL: I think we do have the hard copy of it if you're having trouble finding it.

DR. HUNGERFORD: Here it is.

DR. BARKOVICH: I was going to say, we can probably even do it without this. Okay. So moving, moving to the first slide. Thank you.

Excuse me. And I'm sorry, I have a cold so I'm probably going to be a little croaky.

I think it's important in looking at demand response to focus on the main issues. The first is that the main contributor to summer peaking is residential and commercial air conditioning. That has been quite well documented. And that means that it makes sense for demand response programs to focus on a limited number of summer hours and to reduce, not eliminate, the load.

What I mean by that is as you know we have two different kinds of programs right now. We do have, we do have programs that involve -- for demand response that involve partial

reductions in load for certain customers and that would include air conditioner cycling, that would include the promise of auto-DR. Which is to take an existing customer and reduce that customer's usage to a certain extent but allow that customer to keep functioning and operating, for example, as a business.

I contrast that to a lot of the emergency programs, for example the interruptible rate program, where by and large the customers in the case of an emergency basically shut down. Some of them maintain limited service levels but most of them just shut down.

so insofar as air conditioning load is the major driver of summer peaking it makes sense to focus on applications where you can reduce the usage for lots of customers by a not necessarily all that large amount, but enough to allow them to keep functioning as businesses or to be able to continue to live in those houses.

But on a cumulative basis if you take ten percent of 10,000 megawatts or 20,000 megawatts it is still a lot of megawatts. That seems to be the kind of usage pattern that would be most consistent with trying to shave those

peaks.

And again I would contrast that to an emergency program which comes later in my bullet where at this point you know you've got a problem, you want to shed a chunk of load, and you can do that with a relatively limited number of applications. where the customers understand that under those circumstances they are going to stop working. But that's the tradeoff. They will shut down their businesses in order to meet the emergency requirements of the system.

And the studies that were done in Niagara Mohawk indicated that for a lot of industrial customers they actually preferred to participate in an emergency program like that than in terms of other kinds of partial load reduction programs, given the continuous nature of their operations.

Anther issue that I think is important that we have touched on, but I think only touched on, is that the system load shapes, the system load factors in California are pretty bad. We are talking about system load factors for utilities at about 50 percent.

What that means, it means two things.

It means that for a very limited number of hours you need a lot of generation that doesn't run the rest of the time but you still incur the fixed costs associated with that generation and those still have to be spread over usage in a very inefficient way.

The other thing is that we have off-peak hours when in many cases we have minimum load problems. That is, we actually have generation that needs to run. And on occasion, in the case of wind at night or hydro in wet years, the ISO has to pay people to take the power away.

This suggests that an improvement in the system load shape, in the load factors for the LSCs in California could be very beneficial n terms of using the resources that are available and minimizing the amount of fixed costs that has to be recovered over very limited amounts of time and therefore has to either raise prices or be spread more broadly in some other way.

I think the point I made in my third bullet, and that's what I focus on and I think a lot of the focus is on today is that current rate design can actually impede the goals that you are trying to accomplish here. So moving on to my

next slide. Thank you, David.

Let's talk a little bit about retail rate design. Retail rate design for larger customers has demand charges to recover fixed costs and energy charges to recover variable costs. It has been that way for a long time, as Commissioner Pfannenstiel knows only too well since she and I met over these sorts of subjects.

The reason for that is because there are fixed investment costs or contracted capacity costs for generation, not just variable costs. We don't have a situation where everything is bought out of the spot market like it was during the infamous days of the California energy crisis. But instead we have, we have both fixed costs that are recovered in fixed charges and variable costs that are recovered with variable charges.

If you recover fixed costs with variable charges, that is get rid of demand charges, which may sound very attractive, what you are essentially doing is you are actually engaging in cost-shifting because you are shifting the recovery of those fixed costs to high load factor customers from low load factor customers.

So yes, you're sending a price signal

but those costs are not in and of themselves variable. This is sort of a cautionary tale. I am not saying, don't change rates, we need to change rates, but you will in effect be shifting costs among customers just as we were discussing this morning. And that's reality.

The other thing is that generation rates vary by customer cost in part because different customer classes have different load profiles that impose different costs on the system. If you had all customers pay the same generation charges, and I am not talking about transmission and distribution and customer costs here, just generation, you would again create cost shifting between peakier and less-peaky classes.

So there have been proposals that have been kicked around in terms of, well why should we have different rates for different classes? Why don't we just have the same rate for everybody? And the answer is that there is a certain amount of averaging that goes on that reflects the load shape of those customers.

So unless you are going to have a highly disaggregated rate, that is if you can come up with one that is purely cost of service based and

it takes into account both fixed and variable costs, if you do that you are going to result in more cost shifting. So those are the kinds of concepts we have to be sensitive to.

Okay, next slide.

Retail rates do not reflect wholesale prices. This has been stated before. It's kind of hard to say anything new at this point but I'm trying. Retail energy charges do not track spot wholesale prices; they are designed to recover utility revenue requirements which are based on forecast sales.

Now, should retail rates reflect wholesale prices? We have had a lot of discussion about wouldn't it be wonderful if they could do that. Well let me just offer a few cautionary tales. And again, I am not against retail pricing but just let's talk about context here.

One is that LSEs, load serving entities including the utilities, don't buy a lot of power on the spot market. Spot market prices do not define their cost structure. They pay for resource adequacy, they are encouraged to sign long-term forward contracts to mitigate price volatility. Those are good things. However, what

it means is that if you looked at day-ahead or real time spot prices they are not necessarily going to reflect the cost structure of serving those customers.

Furthermore, if you based retail energy charges on spot wholesale prices that would raise concerns. And you have heard this one before about LSE revenue recovery. Right? The utilities would say, well, there is no guarantee that we'd recover our revenue requirement at the end of the year and we're supposed to recover our revenue requirement. So the answer is we need to come up with a way of providing more price signals, while at the same time trying to take these considerations, you know, into account.

And I'm going to, before I get onto the retail rate issue I just want to do a little sidebar here, to use Ahmad's term. Which is that there is one point in which I actually agree with Marcel Hawiger from TURN and this has to do with passing on wholesale price signals to customers.

If we pursue policies to increase the levels of reserves out of a fear of reliability problems you are never -- at a certain point you are going to undermine your ability to get price

responsive demand because you are not going to get prices that engender a response.

And the reality of the situation is that if you go up to higher and higher levels of reserves, and there are proposals to do that, you will create less and less price volatility in the market. And that's a tradeoff that the Commissions need to think about. They really need to think about how to create a situation where when they want price responsive demand they get it and not undermine that.

The point that Marcel made this morning was a very good one. In Edison's demand bidding program there was very little demand bidding because the prices in the market, despite the fact that we had a really hot summer and things got really tight and they were managed extremely well by the ISO thank goodness, and it required air conditioner cycling and interruptible programs to do it, but the point is that the prices in the market weren't very high.

And if you decide that you want to go to 25 percent planning reserves or something like that don't expect the prices are necessarily going to get any better. So this is a place where as

regulators you have the ability to look at your policy goals with respect to reliability and with respect to demand response and try to make sure that they don't operate across purposes. Okay.

You're ahead of me, David, thank you.

Retail rates undermine certain state policies. what has happened lately is that because of the way in which we have been working on rate design and on marginal cost methodologies they have actually, because of the idea of using forward block prices, not spot prices, although you could use spot prices and right now you've got probably the same effect, and trying to assign them to time of use periods or ultimately it could be to real time prices, actually the results are very flat pricing. Or relatively flat pricing if you look at the actual numbers.

And we have gotten into big debates in the last several Edison and PG&E rate cases and I have no doubt we are going to do it in San Diego as well. What happens is you don't create a lot of incentives in the time of use rate structure for customers to shift load off non-peak period or to shift load to the off-peak period.

And I'll give you an example. I have a

very large, 70 megawatt customer that was planning based on the Edison rates, before this last rate case, on making some major investments in its operations in order to be able to shift a big chunk of load off-peak. When those final rates came out they were so flat that the economic incentive to do that went away and so they cancelled the program.

PRESIDING MEMBER PFANNENSTIEL: Can you help me. I'm still trying to figure out why the marginal cost methodologies lead to that result. I'm having trouble with that.

DR. BARKOVICH: Well what we have is, and we can easily discuss this at greater length later. But what we have is really a kind of goofy way of trying to figure what marginal energy costs are. You and I remember the time when we looked at System Lamda, right? We looked at the utility dispatch costs. Well that is considered proprietary information now so we can't look at those numbers.

Instead what we have is a case where the utilities take forward prices, okay for like one and three year strips of power. Then they do some Black Scholes option pricing analysis to try to

figure out how much power a generator that might be a peaker would sell in the market.

They then look at the variation of prices, not in the current day heaven forbid, which would a function should we say of System LAMDA and might at some point be a function of MRTU, and then decided they are going to shape it using the shape of California power exchange prices pre-energy crisis. Which is from April '98 to April 2000. And they crank all that out and they come up with really flat time of use rates, okay.

And the end result is that the solar people hate it, because obviously it doesn't create a whole lot of incentive for photovoltaic. It doesn't create an incentive for people to shift load off-peak so the Ice Energy people don't like it, the thermal energy people don't like it. I'm giving you a little support here.

And the industrial customers like my customers who, you know, let's face it, it is very disruptive to shift load off-peak. You have to move employees there, you have to have a really good reason to do it.

All of a sudden every three years we do

the rates again and they're flatter and all of a sudden all these things go out the window.

Another thing that really creates problems is we start with these time of use rates that don't vary as much as I think they should to begin with and then we have these wonderful things called non-bypassable charges. You know what they are, PAL and Purpose programs, CARE, et cetera. Well a lot of those are recovered on an equal cents per kilowatt hour basis.

So what happens? You take something that is not very steep to begin with and then you add the same, and in this case it's almost two cents per kilowatt hour. By the time you're finished it's even flatter than it was before. So you're taking whatever price signal you had from your time of use energy rates based on your marginal energy costs and you're flattening it even further.

So with the best of intentions you are actually undermining the very pricing signals you are trying to create, even within the context of time of use rates. What I am suggesting is yet again we really need to think about this in rate design because it has really been the tail wagging

the dog. And we have a lot of policies that are just fundamentally inconsistent and we now need to think about putting them all together. Okay.

I've also got a bullet in here which is about residential rate protection and AB 1X but you have heard that one enough times today. I am going to spare you.

One more issue before I get to my last slide and that is peak time rebates. Much as I have a lot of respect for my friends in the utilities I have to tell you that I have a lot of trouble with the concept of peak time rebates and let me tell you why.

One of them is that a peak time rebate is the opposite of a price-induced demand response. The customer never sees the 70 cents or the 20 cents or the 30 cents. The customer sees the same old rate the customer has always seen and then the customer gets paid on the basis of a load reduction based on a baseline.

Well think about this with residential customers. It's bad enough having to have baselines for certain purposes for large industrial customers, of which there might be a few thousand. But how are we going to do this on

the basis of millions of small residential customers?

The possibilities of gaming are there. I think there has been a study done at the Anaheim experiment that showed that some customers increased their usage during the three day period for the baseline so they could get a bigger incentive when the hot day kicked in.

I think we have to be very careful in a program like this where we are both not showing customers the true cost of their action and then basing actually a payment to them which is going to be paid for by all other customers on the basis of a baseline that has its challenges.

Okay, my last slide, real time pricing in California. Clearly for the first time with MRTU we're going to have day-ahead prices, which will allow us to do day-ahead real time pricing. Something the Commission has been considering for a number of years but never had the pricing to do.

I think that, I think that it is really important for us to be thinking about this now that MRTU is going to be in effect within the next year.

Real time pricing based on real-time

wholesale prices does not provide time to adjust usage and such prices are unrelated to peak load. so I think that -- And this goes to something which I hope MRTU is actually going to do away with. There are really two issues here. One is that if you can give people a day-ahead signal they can react, in real time it is very hard for them to react obviously so the day-ahead is important.

But the other thing is that right now if you look at the actual real time prices in the ISO market what you see is that some of the highest prices occur at 11 o'clock at night and in the morning when you have a shift from an on-peak wholesale contract to a, you know, a 24/7 or to an off-peak contract.

And so I actually went through all the prices in the ISO on an hourly basis for five months last summer trying to figure out where the high prices occurred. In a lot of cases they weren't at all obvious. So we really need to look at what kind of prices are coming out of the market when we have MRTU and whether the high prices are occurring at a time that really is a signal of a need for demand response.

And the ISO may say, well it doesn't really matter because as long as the prices are high and we can reduce demand we'll reduce them but it's going to be hard to sell customers why you want to be reducing their load at 11 o'clock at night.

Once again I mentioned the non-bypassable charges which dilute and distort cost signals. And the last point is how is real time pricing based on wholesale prices going to interact with retail regulation? The whole issue of the two part tariff, the recovery of fixed costs on a demand basis versus a variable cost basis, et cetera. And of course our old friend, are the utilities going to recover their revenue requirement, which is of course the most important inspiration in the world.

(Laughter).

So with that, what I have attempted to do in my croaky voice is simply to point out that we had a lot of different policy balls in the air here. And when they come down it would be nice if they were lined up better than they are right now and I think that's our mission for the next year.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you, Barbara.

Questions? Commissioner Geesman.

ASSOCIATE MEMBER GEESMAN: When did System LAMDA become proprietary? What is the rationale for that treatment?

DR. BARKOVICH: I'm sure there's some utility representatives here who could answer that. But the utilities argued that all their costs in the context of restructuring are subject to confidentiality. I know that the Energy Commission has had some confidentiality issues with the utilities. But so far it's considered to be proprietary market information and it's still treated that way.

MR. BELL: Actually -- May I?

PRESIDING MEMBER PFANNENSTIEL: Go ahead. Please sit and identify yourself.

DR. BARKOVICH: That's what I have been told.

MR. BELL: I'm Andrew Bell from PG&E. And I may not be completely expert in this area but I might be a little bit closer to the operators than Barbara is. And we haven't --

MR. ST. MARIE: Is your microphone on?

MR. BELL: Is that better? Yes.

MR. ST. MARIE: A lot better.

MR. BELL: This is Andrew Bell from PG&E. And I wa saying while the microphone was off that I don't work int eh power operations center and if any of the other utility representatives know better than I.

But my understanding is that we have not had a System LAMDA starting when the power exchange went into operation. And after the power exchange was created we were still essentially operating under instructions from the ISO. So I don't think that we actually have a System LAMDA anymore.

DR. BARKOVICH: Well to respond, I think actually that -- It is my understanding, and again, you are two degrees away from the people who are the experts in this area.

But I have raised this issue, which I have raised it. I was told that the utilities were going to start running production cost models again and that therefore they would have those numbers. Now maybe I'm wrong but that's what I was told.

MR. BELL: Okay, there are production

cost models that we used to run in the old days that would produce the estimated marginal energy costs but that's different from System LAMDA. The System LAMDA that we used to use to run the old time pricing operations didn't come from a production costing model, they actually came from power plants following load. The system doesn't operate that way anymore so it is not relevant.

PRESIDING MEMBER PFANNENSTIEL: Maybe we'll investigate this more because I think that's an important point of where do we get that information.

MR. BELL: I do think -- I just wanted to comment from what Barbara had to say about the changes in how the marginal costs are estimated. I think that any way that you estimate marginal costs, a theme that has come up several times today is that even if you had a way of estimating System LAMDA there are fundamental reasons, primarily because we are at a relatively adequate resource supply right now, that System LAMDA or marginal energy costs however you calculated them, are flatter than they would be in a period when we were in more scarcity.

PRESIDING MEMBER PFANNENSTIEL: Chuck,

did you have a comment on that?

MR. CHARLES KING: Yes. I would just add that the System LAMDA is really a product of the dispatch. Since the ISO is dispatching the system that's where the System LAMDA would reside. Under the current structure we have a significant mount of out of market costs and that will tend to mask what the true System LAMDA is. It is our hope under MRTU that we are going to reduce the out of market costs.

And in fact one of the principles of good market design is to try to incorporate all out of market costs into the prices. And so the locational prices have three components. One is in fact the System LAMDA and then you have congestion and marginal losses. So once we have MRTU prices, you know, perhaps that may be much more useful.

PRESIDING MEMBER PFANNENSTIEL: So maybe you would be the source of the System LAMDA that we may need.

MR. CHARLES KING: Yes.

PRESIDING MEMBER PFANNENSTIEL: Further questions of Barbara?

Thank you, thank you very much.

Ren,e.

MS. GUILD: Thank you for having me. I'm at the tail of the day so I'm just going -- I did try to have just a few slides. Following Barbara is always a joy because she makes a lot of good points.

I am going to take a slightly different tack, which is -- if I could have the first slide. That we really need to focus on more than just the money. That we need to broaden the question to other motivations to get people to do things. Just as there are other factors that bring people to buy Priuses such as collective caring and individual responsibility, status and the use of the diamond lane. We need to make the case that reducing consumption at peak carries status, social responsibility and cachet. That I'm an energy hip consumer.

Rate-making is a blunt instrument. I say that from some experience. And maybe a cudgel where what we really need to do is to play a carrot, or maybe even cappuccinos and chocolate to try to get people to do what we want them to do rather than punish them for not doing what we don't want them to do.

I remember this debate, as Commissioner Pfannenstiel noted, has been going on for decades. When I worked at the CEC out on Howe Avenue in the transportation and load management standards offices I recall B.B. and several others, John Wilson and Cy Goldstone and myself standing around and arguing about why the customer, why the consumers weren't more rational. Consumers of electricity and why they didn't voluntarily -- you know, when they had such short paybacks to engage in these energy efficiency programs we were trying to roll out.

We're still sort of having that debate 30 years later. Well not quite 30 but anyway, more than 25. And it seems to me that what we need to do is to appeal more to broad social mores and look at what makes people want to do things. Especially if I am trying to appeal to the mass market.

As we have heard the residential consumer is a big driver of a lot of the problem here, the peak periods. We need to rethink the question of how do we motivate, explain, educate, get people excited about shifting their load to off-peak. Or even reducing their consumption and

letting it go away because a number of studies have shown that people that start to do this on an occasional basis decide that it's a good thing to do on a regular basis.

So what I'm thinking, I'd like to go through. First of all I also want to say in the interest of full disclosure, I do work as a consultant with a number of AMI vendors so I want you to condition what I had to say with that perspective.

But I truly believe that the answer to this question involves the intersection of electrical information technology with cultural values. And I believe we need technology like smart meters, and even more important home gateways, so that people can get timely information about their consumption.

And also peak consumer interest in these programs. We had some discussion earlier as to the need for consumer interest and the low level of consumer interest in demand response. They don't know what it is. So we need to make that leap. And I believe thorough technologies such as home gateways there can be a fountain of information in the home whereby customers can get

more familiar with their energy consumption when it occurs and what is driving it.

I'm going to drill down in a little bit more detail than Chris King did on a number of studies that show the impact of feedback mechanisms on consumers. On the last page of my slides you have a listing of all my sources.

Sarah Darby's review of nearly 40 projects from the University of Oxford, all over the world, in Europe, England and the US and Canada, found that savings of 5 to 15 percent from various types of electricity consumption feedback was the average. She also found that interactive Internet displays were found to be the most promising methods among residential consumers.

You know a lot of the results. We've talked about the Statewide Pricing Pilot. The California Information Display Pilot Technology Assessment found savings from the devices they reviewed ranged from 4 to 15 percent. And I believe Chris's slide said 10 percent is a pretty good proxy for that.

The Automated Demand Response System Pilot customers increased their load impact savings over time as they learned how to manage

their load better and receive more communications.

Interestingly HYDRO-1 had a 6.5 percent average reduction overall by an in-home monitor that gave direct feedback as to kilowatt hours cost and CO2 emissions with no price incentives. And the results did not vary much between demographics and income and most importantly persisted over time.

Persistence of DR reductions is important, especially as we move into using it as a procurement resource. So we really need to motivate people to stay with the program. And in-home gateway devices are a mechanism to provide information that helps people stay motivated.

I think home gateways themselves can be market transformation instruments. I agree totally with Ahmad's, one of Ahmad's conclusions in the state of demand response report that there is a need to educate customers. But I think the emphasis on a rate-making context is misplaced. Forgive me but I don't think that customers care too much as to the way costs are embedded in various classes of service. Having sat through a fair number of cost of service rate-making hearings myself I really don't think we want to go

there in terms of cross-subsidies.

I think what we do want to explain is the impact of peakers on the environment. Because as Commissioner Chong pointed out earlier, we really do already have the hook. We are at a tipping point. If we talk about global warming in the context of reducing peak, I just brought along a few little, you know.

She mentioned the Save the Planet or Else but we also have the front page factor of the San Francisco Chronicle, the Governor Exports his Brand of Green. The Economist a few months ago with the Greening of America. Last Sunday's New York Times magazine has The Greening of Geopolitics. These are all really interesting articles about how the US wants to assume leadership in the greening of the planet as well as, or we have reflected a sincere desire on the part of California assuming the leadership of the US as well as internationally.

So here are some ideas. I think we should try to look at some corollary programs. I have been very impressed by the green program of the Center for Resource Solutions. They have assembled a great list of businesses that are

certified by their program.

So why not get some businesses to participate in DR programs that could be certified in a similar manner. And either create a CEC certified demand responsiveness customer program or team with the utilities. I have been very impressed by PG&E's leadership in joining the US Climate Action Partnership and there must be some ways that DR could be incorporated into their Climate Smart program.

And I like SCE's in San Diego's referring to the climate change issue as being a burning platform. But we need to start moving now on getting the word out, if you will.

And then some of my remarks are directed expressly toward the Energy Commission because I think -- it's either the next slide or -- I have a slightly different version of the slides. Yes.

When I was working in the transportation office we did a very innovative program called 10 Foolproof Ways to Save Gas. I was the project manager in this effort that involved a grant from Chevron and getting three million of these driver eds pamphlets.

And if you picked up the longer version

of my slides I managed to get copied in the copies I brought today the actual text from this. And the graphics were really entertaining, the text was quite punchy, and it was enclosed in three million drivers -- vehicle registrations from the DMV. I got the DMV to go along with it, which was a bit of a pull.

It was a very successful, long-running program. After I left the Commission to move back to Nevada, Chairman Chuck Imbrecht had it reprinted several times and he used to say it was one of his favorite public/private information programs.

I think that there's opportunities now to work with your sister agencies to quantify and publicize the impacts of DR on reducing harmful emissions from peakers. Nominating outstanding organizations and business that achieve consistent DR for the governor's environmental and economic leadership awards, work with Cal-EPA's climate action team to get DR included in cap and trade or emission credit schemes.

And as the prior slide said, make it fun. That's off the Center for Resource Solutions website. They have these green labels. And in

the longer packet that I put out on the table that I brought along today they have listed on their website a number of businesses that participate in their program, among them Starbucks. And if you follow the link on the site to Starbucks' website they have an interactive game whereby you can go in and identify a lot of things that you as a consumer can do to save the environment.

Also in this packet there is another one from the Smithsonian Institution or from the zoo and it talks about how kids can, you know, enter by the end of this month, stamp out carbon with the Smithsonian's National Zoo in Washington, DC.

So ways of engaging the public are not just the responsibility in my opinion of the utilities in the state but also our state government. And I know that EPA and the CEC have always been models of responsibility when it comes to this but I think that we need to sort of extend the envelope a bit beyond energy efficiency and renewables and vehicular reductions and start thinking about how people with their households and the mass market can really be educated to start making this a lot more ingrained in their daily behavior.

As we saw earlier it doesn't take much. We have been able -- I just was in New Zealand at the New Zealand power conference and California was held up as a model because it decoupled economic growth from energy consumption growth. And we need to do the same thing with decoupling economic growth from peak demand growth.

And we can do that with very small decreases in your peak consumption per household. If we could get a half-kilowatt to one kilowatt over a broad number of households we would have he problem solved. And that would be worth -- I don't know what the numbers are but Ahmad said this morning that a five percent reduction would be 1.8 billion. So, you now, if we even got three percent or less from the residential sector that would be a significant system savings.

And just to conclude, I didn't -- my presentation wasn't very originally titled, I borrowed a quote from the cover article of Newsweek last week. "It's no different than what we tried in Pumping Iron," Governor Schwarzenegger told Newsweek, "It's about making it hip, creating a whole new conversation." Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank

you, Ren,e. Questions?

Great panel, don't go away. First are there questions in the audience for the panel before we open this for general public comment?

If not, thank you all very much. Great information. We appreciate your taking the time and patience to help us struggle with this.

I have two blue cards for people who want to make public comment. If there is anybody else we'll accommodate you also. First, Greg Ashley from Sun Edison.

Not here? Occasionally people fill out cards and then have to leave.

And then the next -- I apologize, I cannot read the handwriting, from Ice Energy.

MR. TROPSA: Greg Tropsa, sorry.

PRESIDING MEMBER PFANNENSTIEL: I wouldn't have seen that at all, thank you.

MR. TROPSA: Thank you. I have handed out the summary of our --

MR. ST. MARIE: Is your microphone on?

MR. TROPSA: I've handed out the summary of our written notes and copies of this are in the back for the participants.

Thank you. My name is Greg Tropsa, I am

the president and founder of Ice Energy. We are speaking in support of the greater adoption of energy storage for thermally driven air conditioning load. The Public Resources Code 25403.5 lists several techniques that the Commission must consider, including end use storage systems which store energy during off-peak periods for use during peak periods.

For the record, Ice Energy manufactures a market transformational, energy storage technology that is efficient and uniquely addresses California's greatest problem, which is thermally driven peak electrical demand.

Until recently the market for thermal storage, particularly the segment served by small, unitary air conditioners that are used for cooling the vast majority of residential, public and commercial facilities remains unserved precisely because of a lack of an available technology to address the problem and appropriate tariffs to generate end-user electrical bill savings.

While I am not here today to discuss our company's specific technology I do wish to reiterate the benefits of storage for the record.

Beyond peak reduction and improved

system reliability there are additional benefits associated worthy of your consideration and support: firming the value of intermittent solar energy; creating a market of the 95 percent off-peak regionally located and growing wind-powered renewable generation resources; the ability, through planning, to defer distribution circuit upgrades; shifting non-price responsive peak load to a cleaner mix of off-peak resources that reduce fossil fuel usage and reduce associated greenhouse gas and NOx reductions; generator source fuel and related emission savings by delivering and efficiently storing energy at night, increasing the use of existing utility assets; improving distribution system reliability by decoupling high temperature driven impacts on microgrids; and stimulating widespread economic development through a large number of geographically distributed projects that if timed properly will generate demand for HVAC technician labor during the off season; and importantly, the economic savings associated with reduced electricity bills.

We hope that the Commissioners will agree with or view that the best way to permanently reduce thermally driven load is to

vigorously pursue emerging growth, market transformational new technology opportunities now commensurate with existing demand reduction strategies.

Recently the Public Utilities Commission ordered the utilities to augment and improve their 2006 through 2008 demand response budgets. In a large sense due to the heat wave in 2006.

Within its decision the Commission found that permanent load shifting can reduce the need for capacity investments, reduce the likelihood of storages -- shortages, excuse me -- during peak periods and lower system costs overall by reducing the need for peaking units.

The Commission called for workshops to consider load management programs such as thermal energy storage. It noted that thermal energy storage technology, which creates permanent shifts in load rather than dispatchable load drops, had not been considered to date.

We agree with the conclusion and believe that it is important that all of the state's energy agencies communicate the importance of energy storage strategies as an integral part of the state's overall demand response initiatives.

The California Energy Commission published a report entitled Source Energy and Environmental Impacts of Thermal Energy Storage. In that report the Commission found that energy storage for thermally driven load provides major completing benefits of concern to the California Energy Commission, notably energy efficiency through the reduction of both source and site energy, environmental air emissions savings and economic development and competitiveness.

The report listed several interesting policy actions. Make thermal energy storage a priority DMS technology in energy policy decisions. Modify California's Title 24 Building Standards to reflect TES's source and site energy savings and peak demand reductions. And use TES as an air emissions control measure statewide.

So the first possible policy action is making thermal energy storage a priority for energy efficiency measure or demand-side management programs in state energy resource policy decisions. TES has demonstrated energy and air emissions savings like other energy efficiency programs. But unlike most energy efficiency measures, TES greatly improves load factor and

provides cost savings that help both energy users and energy suppliers be more competitive.

The CEC also implemented a second policy action through the introduction of its time dependant methodology in the Title 24 2005 Building Energy Code. The CPUC followed in kind by adopting the E3 or the avoided cost methodology.

The California Air Resources Board is also very interested in the prospect of using thermal energy storage as a statewide emissions mitigation control measure. Recent studies of the Sacramento Metropolitan Air District confirm the CEC's findings that load shifting of thermally driven air conditioner energy can reduce NOx emissions by over 50 percent and associated carbon emissions by 40 percent.

However we find the lack of comments about energy storage in the Brattle Group's report summarizing the state demand response in California speaks in itself to our request to the Commission today.

Which is that you implement the recommended policy action and make energy storage for thermally driven load a priority DSM

technology in your energy policy decisions.

In commentary I would like to talk to one slide and then I'll be concluded, which is on page 14. It looks like this.

PRESIDING MEMBER PFANNENSTIEL: Page 14. I'm sorry, page 14 of what?

MR. TROPSA: There is a handout in front of you which is my -- yes.

PRESIDING MEMBER PFANNENSTIEL: We have it, thanks.

ASSOCIATE MEMBER ROSENFELD: Thanks you.

MR. TROPSA: And what it shows, it shows the importance of energy storage. Notably efficient energy storage that works for residential, small commercial and public customers as an integral element of being able to implement and get at non-price responsive load.

In discussions with the California ISO what they find particularly interesting about this device is that it is bi-directional. So rather than the customer having to change their behavior to react to a price signal the storage mitigates the behavior. So when the price is low simply the condensing unit runs to store energy. When the price is high the storage module delivers the

cooling comfort to the customer. So the customer is always able to benefit by the optimal mix of price.

From a utilities control perspective or the ISO control perspective, these can be distributed long networks or aggregated in clusters behind congestion zones. And not only can they be used to curtain load but they can be used to bring load onto the system. And a very useful tool for a system imbalance energy. So it fits and complements the use and deployment of AMI and smart meters and real time transparent pricing or whatever price tariff you would like to choose.

Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thank you very much.

ASSOCIATE MEMBER ROSENFELD: I have a question.

PRESIDING MEMBER PFANNENSTIEL: Yes, Art, go ahead.

ASSOCIATE MEMBER ROSENFELD: Good. I have a question. I'm a fan of Ice Bear and thermal storage and you have already got an alternative compliance report from the Energy Commission which gives you credit for time

dependant evaluation and claims that your stuff is cost-effective. I am not sure what else you're asking the Energy Commission to do.

MR. TROPSA: As part of the proceedings we find that there are a lot of resources tied to very specific programs such as programmable communicating thermostats and there is a lot of information that the Commission communicates in meetings such as this. And we don't find that load thermal energy storage to be equally represented and discussed and just considered as a basic part of the basic policy for demand side management.

One comment. The term itself, demand response, could be expanded to demand side resources and then it could be clearer that load management technologies and load shifting technologies fit within the framework of the conversation at the table.

ASSOCIATE MEMBER ROSENFELD: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Thanks. Barbara, you had a comment?

ASSOCIATE MEMBER GEESMAN: I had a question.

PRESIDING MEMBER PFANNENSTIEL: I'm

sorry. Commissioner Geesman.

ASSOCIATE MEMBER GEESMAN: I actually think your point is quite well taken but my question goes to page five of your report. You mentioned it in your verbal presentation. Recent studies of the Sacramento Metropolitan Air District.

MR. TROPSA: Yes.

ASSOCIATE MEMBER GEESMAN: Published studies?

MR. TROPSA: Yes.

ASSOCIATE MEMBER GEESMAN: Can you make those available to us?

MR. TROPSA: Yes. We commissioned an energy environmental firm, E3, and they worked with the Sac Metro Air District and SMUD to determine the mix of generation resources. It's a very detailed report and we'd be pleased to make it available to you.

PRESIDING MEMBER PFANNENSTIEL: And Barbara, you had a question.

DR. BARKOVICH: I just wanted to point out that --

PRESIDING MEMBER PFANNENSTIEL: Turn on your mic, please.

DR. BARKOVICH: I am not sure it's worthy of that. You had indicated, you had called on a speaker before who was gone, I believe he has returned. I just wanted to point that out to you.

PRESIDING MEMBER PFANNENSTIEL: Thank you.

MR. TROPSA: Thank you.

PRESIDING MEMBER PFANNENSTIEL: Greg Ashley.

MR. ASHLEY: Thank you very much nd thank you for this workshop.

PRESIDING MEMBER PFANNENSTIEL: Would you make sure the mic is on.

MR. ASHLEY: I'm sorry.

PRESIDING MEMBER PFANNENSTIEL: The green light should be lit, illuminated.

MR. ASHLEY: Greg Ashley, I work for Sun Edison. We're a solar energy services provider at both customer retail level and utility level. And I just want to make a point that with energy storage we can offer, the solar industry can offer more firm delivery, day-ahead or even farther. And also incorporate load-shifting to cover into when actual peaks occur or later peaks following the actual peaks in California.

On the customer level there is also a system developed by Richard Perez, I don't know if most folks have heard about it but it's a little load controller that actually takes into account modeling of demand and incorporates it into a combination of solar integrated with load control, also integrated with energy storage.

And these are technologies that have been available but the price signals need to be there so tariffs are absolutely key. I think the solar industry can respond to cost of service, and if cost of service was transparent the industry would be much, much stronger and could grow much more quickly. And our prices, energy prices from solar are coming down to be competitive with cost of service and I think it needs to be considered that way.

Anyway, thanks very much.

PRESIDING MEMBER PFANNENSTIEL: Thank you. Anybody else have public comment to offer?

Hearing none I want to thank all of the participants today. It was a very useful, meaty and fulsome day in terms of information exchange. I think that there is a lot of consensus on a number of issues and some difference of opinion on

others.

As I said at the outset, this is the first of two days of workshops that we are going to hold on demand response. The question that I posed today was why are we not getting where we thought we should be by now and you gave us, I think, a lot of information on that and also started on the second day, which is and so what do we do differently and what are some of the strategies.

Looking very specifically at some of our options on load management standards and other I think ways of thinking about bringing demand response into the electric sector in more successful ways than we have in the past.

Are there final comments from the dais?

Well then once again thank you all very much for your participation, we'll be adjourned.

(Whereupon, at 4:24 p.m., the Committee workshop was adjourned.)

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CERTIFICATE OF REPORTER

I, JOHN COTA, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Committee Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said workshop, nor in any way interested in outcome of said workshop.

IN WITNESS WHEREOF, I have hereunto set my hand this 30th day of April, 2007.